



One NSTAR Way
Westwood, Massachusetts 02090

January 21, 2005

Ronald F. LeComte
Director, Electric Power Division
Department of Telecommunications and Energy
One South Station, 2nd Floor
Boston, MA 02110

RE: Maintenance and Inspection Practices of Underground Facilities

Dear Mr. LeComte:

On December 14, 2004, the Department of Telecommunications and Energy (the "Department") issued a request for information from NSTAR Electric Company ("NSTAR Electric" or the "Company") regarding the workforce practices associated with the construction, maintenance and inspection practices of underground electric distribution facilities. In its request, the Department directed the Company to submit written responses to six questions by January 21, 2005. This letter provides the Company's responses to the Department's information requests.

A. Introduction

From an overall perspective, NSTAR Electric strives to be an industry leader in terms of achieving a high level of workmanship in the construction, maintenance and inspection of underground distribution facilities. To fulfill this objective, NSTAR Electric has developed a business process designed to create a workforce that is trained, informed, well-equipped and proactive in maintaining the reliability of the system and the quality of service to customers. As discussed in detail below, this strategy requires the involvement of a broad cross-section of the Company's operating departments, including purchasing, engineering, performance management, customer service, project management, and craft and compliance training.

B. Response to Department's Questions

1. **Specify the process used to procure electrical contractors for work on underground facilities. Provide an actual request for proposals and a resulting services contract used in the process.**

NSTAR Electric typically uses a competitive bid-solicitation process to procure electric contracting services when there is a general or specific need for outside support. Appendix 1.1 is a flow diagram of the NSTAR Electric Procurement Process. To facilitate this process, the Company maintains a qualified bidders' list composed of "pre-approved" electrical



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contractors. Qualified contracting firms are pre-approved by the Company pursuant to a process discussed in Question 2, below.

The Company's purchasing department maintains a file of information on each contract entered into for outside services. Any deficiencies in workmanship quality or safety are documented by the Company's purchasing agent. In cases where the Company has detected an adverse performance trend, NSTAR Electric will require the contractor to provide an improvement plan in writing to remedy the Company's concerns within a specified time frame. The Company's safety department is notified that the contractor has been put on notice and that the contractor will not be allowed to participate in bids until steps have been taken to rectify the situation. If the contractor fails to show improvement, the contractor is removed from any ongoing projects and is prohibited from participating in future bid solicitations on the NSTAR Electric system.

When a competitive solicitation is conducted by the Company, each pre-qualified contractor on the bidders' list receives an invitation to bid. A copy of a typical "request for proposal" is attached as Appendix 1.2. The Company conducts pre-bid and pre-award meetings with the contractors involved at these levels to ensure that the scope of the work is fully understood. Once the Company awards the contract, a pre-construction meeting takes place with the contractor. Work is awarded to the most qualified contractor based on a commercial and technical evaluation process. Appendix 1.3 is a copy of a sample electrical services contract.

2. Identify the qualifications that are required for outside electrical contractors that perform work on underground facilities (e.g., license, training, courses required for each task performed, years of experience).

All construction and maintenance activities performed on an electric utility system must conform to the requirements of the National Electric Safety Code (NESC). As the operator of an electric utility system, it is NSTAR Electric's obligation to ensure that its system is designed, constructed and maintained to conform to NESC standards. Accordingly, NSTAR Electric has developed a comprehensive set of construction and maintenance work standards based on NESC requirements. Any contractors working on the NSTAR Electric underground distribution system are required to adhere to the Company's work standards. Specific licensing requirements are not a component of the NESC, and therefore, are not a requirement to perform construction and maintenance activities on the NSTAR Electric system.¹ For this reason, the process used by the Company to procure services from electrical contractors is aimed at identifying and qualifying electrical contracting firms that have solid management structures, financial integrity and a high level of expertise, as well as being knowledgeable about the Company's construction and maintenance standards.

¹ The National Electric Code (NEC) applies only to electrical contractors performing interior residential and commercial work under licenses issued by the relevant municipal jurisdictions.



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As noted above, NSTAR Electric's purchasing department maintains a list of pre-approved, qualified contractors who are permitted to participate in the procurement process for various types of work. In that regard, NSTAR Electric hires only those contractors that have significant expertise in performing construction and maintenance services on electric utility system equipment. An electrical contractor that is hired by the Company has the responsibility to perform all contracted services in accordance with NSTAR Electric construction standards, safety policies and all applicable laws.

Before a contractor is placed on the pre-approved bidders' list, NSTAR Electric evaluates the contractor based on a number of criteria. Primarily, NSTAR Electric will: (1) conduct an extensive interview with the contractor to assess their level of experience and expertise in relation to the work in question; (2) verify references to confirm technical competence; and (3) perform a financial background check to determine the financial stability of the contractor. A team consisting of representatives from the Company's engineering, operations and/or safety and training departments may participate in the interview. At times, NSTAR Electric will request the contractor to demonstrate certain skills, such as cable splicing.

In addition, NSTAR Electric reviews the overall performance of the pre-approved contractors on an annual basis. Because the electrical contractors that are pre-approved by the Company are well-established entities that employ a skilled and dependable work force, there is generally little variation in the list from year-to-year and NSTAR Electric typically has many years of experience with each of the contractors on the list.

In that regard, there are three primary groups that are qualified to perform construction and maintenance work on the NSTAR Electric underground distribution system. These groups are: (1) NSTAR Electric employees; (2) electric contractors represented by collective bargaining units; and (3) electric contractors with no bargaining unit affiliation. NSTAR Electric employees are hired and trained by the Company. Electrical contractors that are represented by a collective bargaining unit generally receive training within their bargaining unit. Electrical contractors with no bargaining unit affiliation receive training from a number of places including cable manufacturing companies and the Northeast Public Power Association, which is an organization that offers training for employees of municipal electric companies.

3. Explain the process for supervising, reviewing, and approving the work of outside electrical contractors.

NSTAR Electric employs Construction Inspectors (CIs) and Contract Technical Representatives (CTRs) to review the work performance of contractors. CTRs, who are generally supervisors or managers, are responsible for overall coordination of contractors for each specific job. CTRs authorize invoice payments and resolve contractual or performance issues that may arise. Under the direction of the CTR or the designated supervisor, CIs assist in the daily planning and implementation of the work of underground crews (NSTAR



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Electric and contractors). CIs inspect the work in progress to assure compliance with all drawings, specifications, construction standards and safety procedures and are charged with verifying the quality of workmanship and materials. CIs may on occasion also act as a liaison between the design engineer, the CTR and the contractor crew to resolve any quality or material discrepancies that may arise. Lastly, NSTAR Electric standards require the testing of new cable and splices for projects that involve the installation of multiple cable sections.

4. Identify the qualifications that are required for in-house Company electrical workers that perform work on underground facilities (e.g., license, training, courses required for each task performed, years of experience).

NSTAR Electric has a comprehensive qualification and training program in place to prepare in-house employees for work in the field on the underground system. In that regard, there are four primary job classifications that perform construction and maintenance work on the NSTAR Electric underground distribution system. These classifications are: (1) UG Lineworker Class 1; (2) UG Lineworker Class 2 (Part I and II); (3) UG Lineworker Class 3; and (4) Troubleshooter. In addition there is a Cable and Conduit training component, which is a program required for employees progressing to the "Leader" level.

Attached as Appendix 4.1 through 4.5 are summaries of the training programs for each of these classifications. The summary for each training program contains the following materials:

- A progression template describing the prerequisites, amount of classroom time and required field work that must be completed in order to have competency in the field. A flowchart shows the minimum amount of time required to remain in each classification before progressing;
- A day-by-day curriculum;
- A position profile listing job specifications and describing the role and scope of the position, its essential functions, and the technical knowledge, skill, education, licenses and/or certifications that are required for a person to be considered for this position. Also included is illustrated duties and working conditions;
- A matrix describing classroom work that needs to be completed and evaluated by a competent person for successful completion.

Through the training schedule, NSTAR Electric employees will receive training on NSTAR Electric work methods and standards, construction standards, operating procedures, and safety policies. Before being allowed to work in the field, employees must pass written and oral tests and hands-on task examinations.



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- 5. Explain whether your Company maintains a splicing and repair log containing such information as dates of installation, crew members performing the work, and materials used. If this type of information is maintained, is it stored in an information database?**

NSTAR Electric maintains three data management systems that track information relating to construction and maintenance work on the underground system, including dates of installation, the materials used, and the NSTAR Electric crew members or electrical contractors performing the work. These three systems are the Work Management System, the Outage Database and the DDS and Network Feeder Database.

The Work Management System tracks data relating to the locations where work is being performed (e.g., manhole locations), the purpose of work being performed (e.g., new installation, corrective maintenance, preventative maintenance), the materials required to perform the job and date information regarding job completion. The primary purpose of the Work Management System is to manage work schedule and costs at a project level rather than the individual employee.

The Outage Database contains information on the date, time and location of system events resulting in customer outage. The DSS/Network Feeder Database contains date and location information for failures on the DSS and network system regardless of whether the failure resulted in customer outage.

In addition to information recorded in the databases listed above, the Company maintains records in the Dispatch Office, denoting the occasions when "system clearance" is required for work on existing feeders and lines. These "master work cards," contain information such as the name of the splicer performing the work, the manhole number being worked on, the feeder number and the date and time the work was performed on the system. This information pertains to work on underground feeders or lines that are part of the distribution system and are undergoing repair or expansion.

- 6. Explain the training program in place for personnel that work on underground facilities.**

Please see the response to Question 4 regarding the qualifications and training for underground personnel on the NSTAR Electric underground distribution system.



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NSTAR Electric appreciates the opportunity to provide the Department with information regarding the workforce practices associated with the construction, maintenance and inspection practices of underground electric distribution facilities. NSTAR Electric has a strong customer service commitment and a trained, informed and well-equipped workforce is critical to that effort.

Sincerely,

Kerry Britland (EJH)

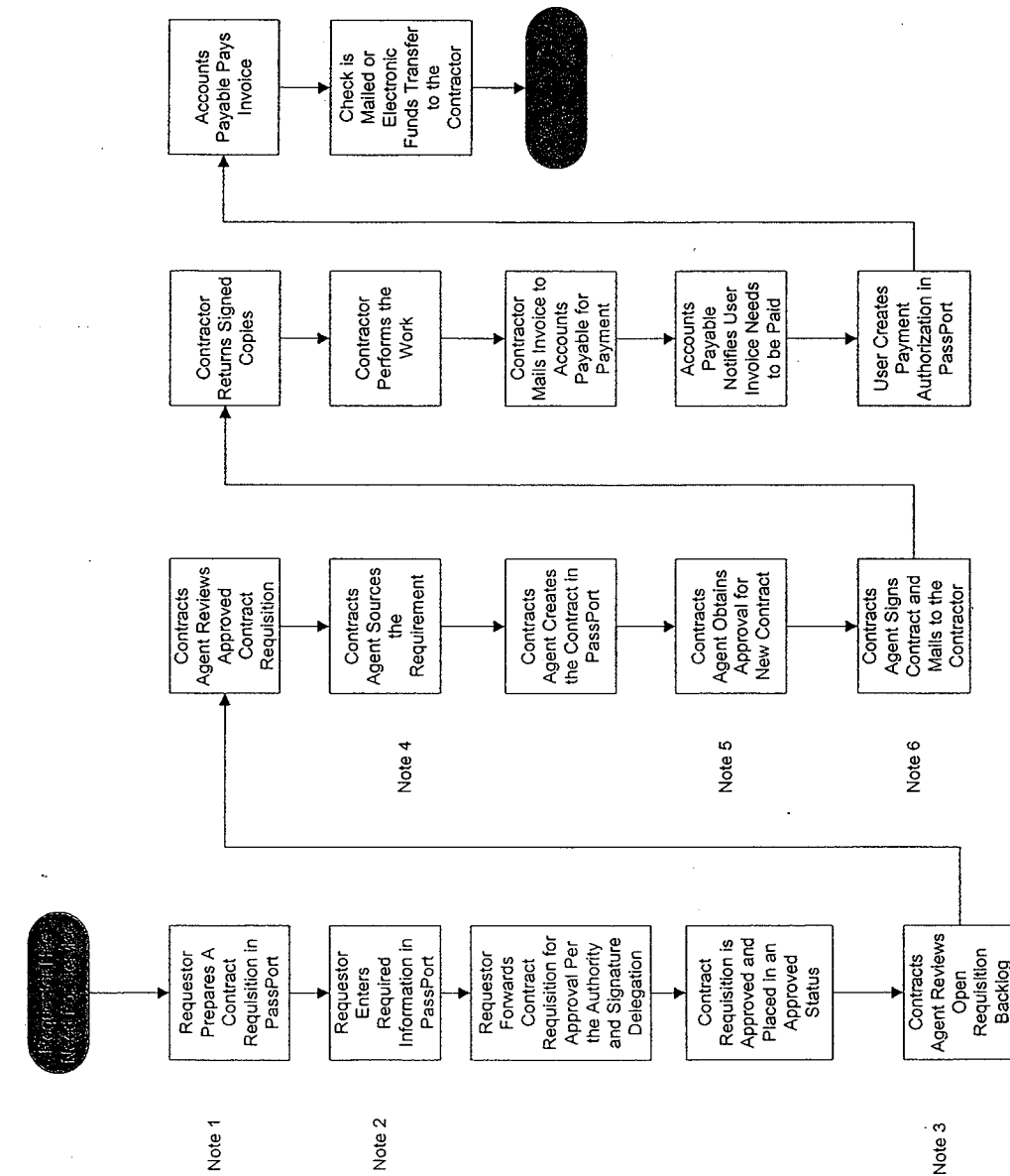
Kerry Britland

cc: Chairman Afonso and Commissioners
John Cope-Flanagan, Esq.
Mary L. Cottrell, Secretary
Timothy J. Shevlin, Jr., Executive Director
Andrew O. Kaplan, General Counsel
Ghebre Daniel, Electric Power Division



Procurement Methods Flowchart

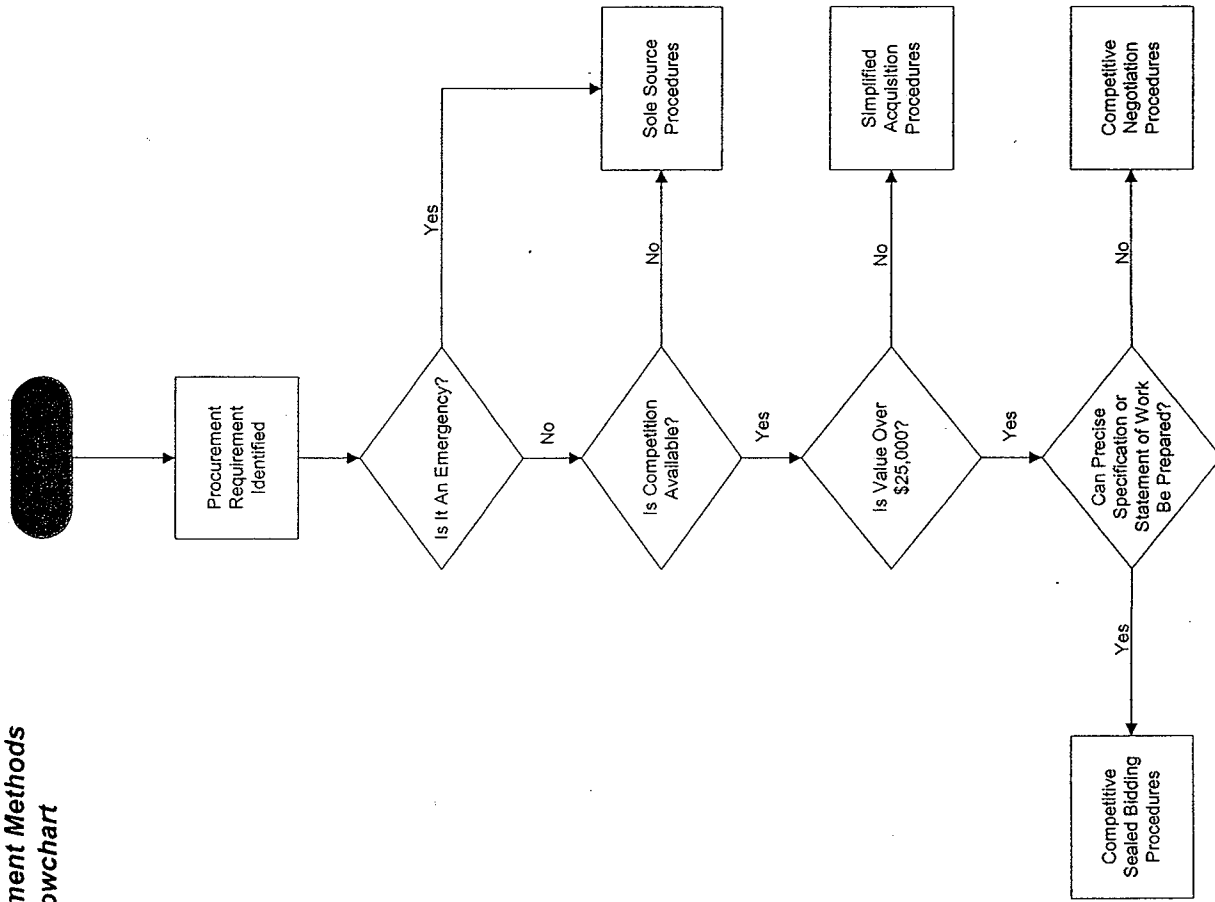
CONTRACT REQUISITION WORK PROCESS



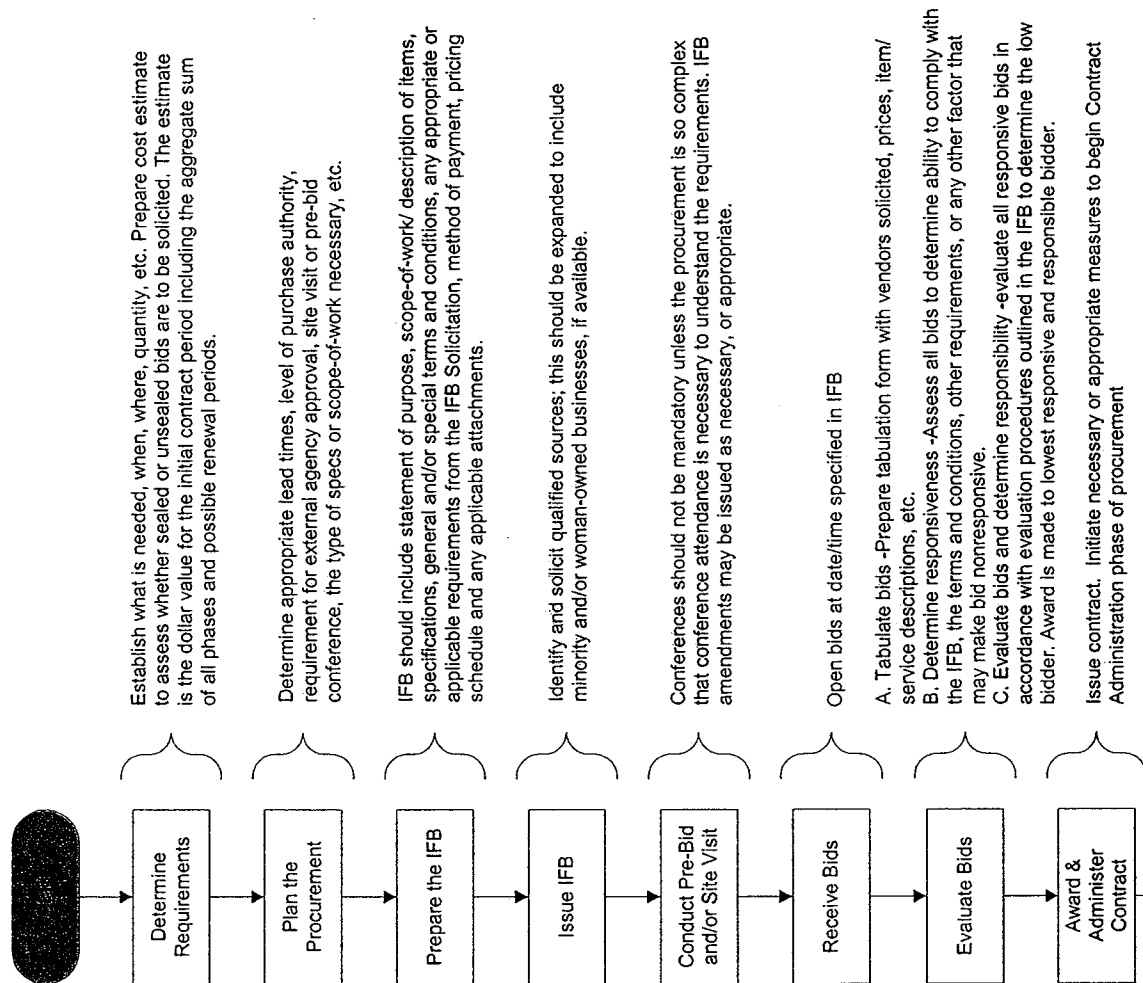


SOURCING PROCESS

Procurement Methods
Flowchart



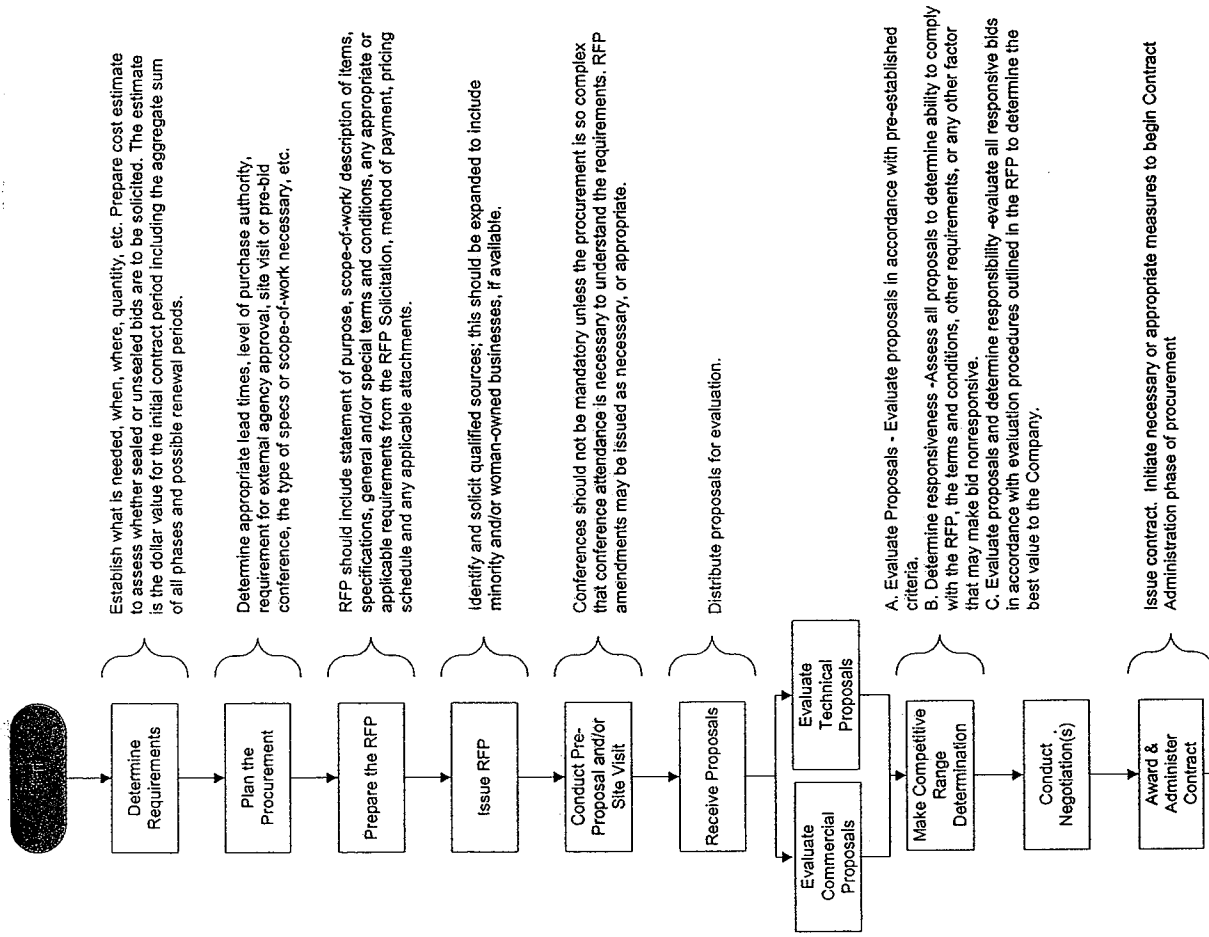
COMPETITIVE SEALED BIDDING PROCESS





COMPETITIVE NEGOTIATION PROCESS

Procurement Methods Flowchart



REQUEST FOR PROPOSAL

THIS IS NOT AN ORDER



NSTAR Electric & Gas Corporation

RFP : 00000872
Due Date: 04/23/04
Due Time: 12:00 EST
Printed : 01/17/05
Page : 1

Appendix 1.2

Return RFP to:

SUSAN RICHARDS

PROCUREMENT - CONTRACT SERVICE

ONE NSTAR WAY

MAILSTOP SE250

WESTWOOD MA 02090

Vendor:

PROCUREMENT DEPARTMENT COPY

SE250

ONE NSTAR WAY

WESTWOOD MA 02090

Phone: 781-441-8521

Fax : 781-441-8503

NSTAR Electric & Gas Corp agent for

Boston Edison Company

Start Date: 06/01/04

End Date : 07/16/04

Title:

** DUPLICATE COPY ** DRAFT COPY **

Bid Value:

Currency: USD

Not to Exceed?

Bid Pricing Method:

LUMP SUM FIXED PRICE

Bid Expiration Date:

Vendor Authorized Signature

Authorized Signature

Printed Name/Title

Printed Name/Title

Date Signed

Phone

Date Signed

Phone

Key Contacts

Role

Contact Name

Phone/Fax

Company

FIELD REP THOMAS SCHLEHUBER

120 Boston E

INVOICE REVW THOMAS SCHLEHUBER

120 Boston E

* * * End of Request For Proposal * * *



GAS One NSTAR Way Westwood MA 02090

REQUEST FOR PROPOSAL #872

01/17/2005

PLEASE NOTE: The following documents are relative to this "Bid to Negotiate". This request for proposal is not a guarantee of any work, authorization to commit company resources or a commitment for future bid solicitations on this, or any other work. The response shall include a separate section sequentially addressing exceptions taken to the Company's documents and alternative language for consideration.

IMPORTANT DATES:

Pre-Bid: 4/7/04

Last Date for Questions: 4/21/04

Bids Due: 4/23/04 noon

Work Starts: wk of 5/31/04

Work Ends: 7/16/04

PRE-BID:

DATE: 4/7/04 WEDNESDAY

TIME: 9:30AM

LOCATION: SUMMIT WEST CONF RM SW1G

>Please call to confirm attendance

CORRESPONDENCE

During Request for Proposal, up to and including award of Contract, all correspondence must be directed via email or fax to:

Susan Richards
Sr. Contracts Agent
NSTAR Electric and Gas Corporation
susan_richards@nstaronline.com

All technical and commercial questions must be submitted in writing and addressed to the Procurement Department, ATTN: Susan Richards, Senior Contracts Agent on or before 4/21/04. For your convenience, documents (except proposals) may be faxed to the Procurement Department directly at (781) 441-8503 or e-mailed: susan_richards@nstaronline.com. Until the time an award is made, there will be no direct communication outside of the Procurement Department. After award, the successful vendor may address technical questions directly to the Company's Project Supervisor, with an informational copy of all such communications sent to the Procurement Department.



SE250 One NSTAR Way, Westwood MA 02090

TO ALL CONTRACTORS;

PLEASE BE ADVISED EFFECTIVE IMMEDIATELY ALL PRE-BID MEETINGS FOR UNDERGROUND ARE **MANDATORY!**

IF A REPRESENTATIVE IS NOT AT THE PRE-BID YOU CAN NOT PARTICIPATE IN THE BID PROCESS.

THERE WILL BE NO EXCEPTIONS

REQUIRED SPECIFICATIONS

1. Performance Specification

1.1. Terms and Conditions of Construction – Agreement. Must be signed prior to participating in any NSTAR construction work.

1.2. Exceptions - Commercial/Technical

This section of the proposal MUST state clearly any exceptions, which are being taken to the technical and commercial requirements of this RFP. Exceptions must state what the exception is, the reason for the exception and proposed alternate language and be organized sequentially in accordance with the organization of the RFP. Any and all exceptions MUST be clearly defined.

1.3. Insurance Certificate(s)

Include Certificate(s) of Insurance evidencing compliance with the following insurance types and coverage's as itemized in our TERMS AND CONDITIONS OF CONSTRUCTION

If a Contractor/Supplier cannot meet the insurance requirements established by NSTAR, he shall forward a copy of his insurance certificate indicating what he has for coverage and shall include for each coverage that is deficient, a written explanation why he cannot fulfill NSTAR's requirements. These items shall be forwarded to Susan Richards, Contracts Agent; NSTAR Electric and Gas Corporation, One NSTAR Way, Westwood MA 02090.

1.4 Subcontractors

The Vendor MUST identify each subcontractor by name and address that will be providing services under a potential award.

1.5 Surety Bond

Contractors shall, if so requested,, furnish to the Company within ten(10 calendar days) after acceptance of the Contract, a Performance and Payment bond for the faithful performance of the Contract, the penalty thereof to be one hundred percent (100%) of the Contract Price.

If requested, as part of the proposal, the Vendor must include a letter from Vendor's bonding company indicating the ability for this project a performance and payment bond and the required cost. Itemize this cost as an optional separate line item; and include it in your lump sum bid response.

1.6 Environmental Issues

~~Unless otherwise specifically provided in the scope of work, the proper, safe and lawful disposal of all material~~ used or removed in the performance of the Work, including without limitation oil and hazardous or toxic materials, as defined by applicable law, is the sole responsibility of the Contractor. Upon request, the Contractor shall provide the Company at any time during and after the performance of the Work with documentation evidencing proper disposal of all such materials.

1.7 Award

NSTAR reserves the right to award all or a portion of this RFP to a single Contractor or Contractors.

1.8 Invoicing

Invoices shall be submitted to:

NSTAR Electric & Gas Corporation
ATTN: Accounts Payable
PO Box 250
Norwood MA 02062-0250

Include Name and Locations of the job; Contract Number, Work Order Number and Tasks.

Appropriate back-up information approved by the Contract Technical Representative must be provided for payment authorization, i.e. time sheets, work reports, etc.

1.8 Warranty

It is understood all Civil and Electric work is subject to a (1)one- year warranty, covering backfill, paving, finished concrete etc and all workmanship covered under this Request for Proposal.

All warranty work performed by the Contractor shall be scheduled at times acceptable to the Company.

Contractor shall obtain from each of its Subcontractors and extend to the Company, warranties for all work supplied by its Subcontractors. Any such warranties shall be in addition to and shall not be limited by or themselves limit, the warranties of Contractor otherwise provided in this Agreement. Contractor shall deliver to the Company copies of all Subcontractors warranties if required.

1.9 Safety Requirements

All safety procedures are to be in accordance with NSTAR's "NSTAR SAFETY RULES FOR CONTRACTORS AND SUB-CONTRACTOR". Contractor will also provide all safety equipment needed protect workers, motorist and general public from injury. All safety rules will be strictly enforced by NSTAR Supervisors and Safety personnel.

All work described shall be performed in accordance with the Boston Edison Company "General Specifications for "Underground Conduit and Manhole Construction" (Code 19).

2.0 Site House Keeping

The contractor is also required to return all public and private property to its natural state proceeding construction. The Contractor shall at all times keep the Worksite free from accumulations of waste material or rubbish caused by the Work, by its employees, or by any Subcontractor. Cleaning shall be carried out day by day as may be necessary for the Work installed by the Contractor or to facilitate the Work of any Subcontractor under this Contract. Waste materials and rubbish shall be removed from the Site at each cleaning and properly disposed of in accordance with any applicable environmental laws or regulations as noted above.

2.1 Pricing

In case of a Firm Fixed Price (FFP) "lump sum"; all appropriate back up justification is required. This detailed level of cost information would be utilized to determine cost realism.

PROPOSAL FORMS

FORM A - Bid Receipt Acknowledgment Form

This form is used by the Vendor to confirm to Company receipt of the bid package and intent to bid. **It must be faxed to Susan Richards, Senior Contracts Agent at (781) 441-8521 prior to bid due date.**

FORM B – Vendor Bid Proposal Form (cover sheet)

Form B - Vendor Bid Proposal Form (Cover Sheet) **MUST** be the first page of the Vendor proposal.

EXECUTION OF RFP

Vendor's response must note the RFP number on the outside of the bid envelope. The **ORIGINAL AND ONE(1)** copy of the proposal **MUST** be sent no later than the date and time stated in the cover letter to:

Ms.Susan Richards, Sr. Contracts Agent
Procurement – SE250
NSTAR Electric & Gas Corporation
One NSTAR Way
P.O. Box 9230
Westwood, MA 02090-9230

FORM A

BID RECEIPT ACKNOWLEDGMENT FORM

ATTN: Susan Richards - 781-441-8503(fax)

The _____ Company hereby:

I acknowledge receipt of the above listed Bid Documents

_____ My proposal will be submitted on the required due date.

_____ I do not choose to bid, as fully explained in letter to be transmitted under separate cover.

Our Proposal shall list the following companies as joint venture partners or

Subcontractor/s:

Please address future inquiries on this work (if different from original mailing) to:

Name: _____

Company: _____

Address: _____

Phone: _____

Fax: _____

Email: _____

by: _____

(Signature) _____

Title: _____

Date: _____

FORM B

**VENDOR BID PROPOSAL FORM
(COVER SHEET)**

NAME OF VENDOR: _____

ADDRESS: _____

NAME OF AUTHORIZED REPRESENTATIVE: _____

TITLE OF ABOVE: _____

PHONE NUMBER OF THE ABOVE: _____

FAX NUMBER OF THE ABOVE: _____

EMAIL ADDRESS OF THE ABOVE: _____

- Vendor represents that this proposal is its complete offering and includes all exceptions to this RFP.
- Vendor agrees that this proposal will be valid for a minimum period of 90 days from date of submittal.

Execution of Proposal by Officer of Vendor _____
Signature/Date



**NSTAR SAFETY RULES
FOR
CONTRACTORS AND SUB-CONTRACTORS
WORKING
ON NSTAR ELECTRIC & GAS CORPORATION SYSTEM AND FACILITIES**

General

It is mandatory that all Contractors and Sub-Contractors familiarize themselves with these safety rules before submitting quotations or accepting orders to perform work for the NSTAR Electric & Gas Corporation (NSTAR).

It is the responsibility of the Prime Contractor to enforce these safety rules with her/his own personnel as well as with personnel of Sub-Contractors who he/she engages for performing the requested work action. Compliance with these safety rules does not relieve or diminish the responsibility of the General Contractor to perform the work in a manner that complies with applicable Federal, State and local laws, rules, regulations and/or requirements, nor is the General Contractor relieved from liability to NSTAR or others for negligent or improper performance of the work.

The Contractor shall assign a competent person as required in 29 CFR 1926.20(b) and defined in 29 CFR 1926.32(f) to each construction site. The competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

A notification of such an assignment shall be made by completion of the attached "Contractor Notification of Designated Competent Person" form with copies of the completed form provided to:

1. The NSTAR Electric & Gas Corporation's Safety and Health Services Department.
2. The NSTAR Construction Inspector or representative assigned to the project.
3. The contractor's designee who shall ensure that a copy of the form is available at the project site at all times.

Safety-related communication between the contractor and NSTAR Electric & Gas Corporation should be made through these designated representatives. This provision will be strictly enforced by NSTAR. Failure to comply will result in a work shut-down at the contractor's expense, and possible removal from the approved vendor's list.

No work shall start without knowledge and approval of NSTAR's Construction Inspector or representative, who will provide the contractor with specific instructions as to the work action.

Reprimands or disciplinary actions for safety violations shall be made by contractor's designee. However, if safety violations either as to personnel or equipment are noted by the NSTAR representative, the NSTAR representative will be empowered to halt work progress at the contractor's expense until such time that the unsafe procedure has been corrected.

The contractor shall obtain and have available current issues of U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), General Industry Standard 29 CFR 1910 and Construction Standard 29 CFR 1926. These references form the basis of our Safety Procedures and shall be followed except where more stringent procedures are specified by the NSTAR Electric and Gas Corporation.

Contractors have the responsibility to familiarize themselves with and enforce, not only NSTAR's Safety Procedures but also special municipal and/or State requirements as may be applicable to the work. In case of conflict in specifying the safety rules among all applicable requirements, the most stringent rule shall be implemented.

Specific Safety Rules –

In general, contract personnel are required to adhere to all applicable safety work practices utilized by NSTAR personnel when performing the same or similar functions.

1. Contractors' personnel are forbidden to operate control switches, valves, circuit breakers, disconnecting switches or such similar devices, which are part of NSTAR's operating plant; unless specifically directed to do so by responsible NSTAR personnel.
2. Hard Hats and Safety Eyewear shall be supplied by the contractors and worn by their personnel in all designated work areas or work situations. Metal type "hard hats" are prohibited. Contractors shall also provide at her/his expense all other required protective equipment to meet the applicable OSHA regulations.
3. Safety shoes are required for personnel assigned to work functions hazardous in terms of toe or foot injury. Wearing of open-toe shoes, sneakers or similar light footwear shall not be permitted.
4. Flame resistant clothing that has an "Arc Thermal Protection Value" (ATPV) is required for work in any area where workers may be exposed to an electric arc. Contractors must comply with the requirements of the NSTAR FR Clothing Program.
5. No alcoholic beverages shall be brought to or consumed at the work sites. Personnel are prohibited from drinking alcoholic beverages during meal periods or other authorized interruptions of work occurring during working hours, including overtime periods.
6. The illegal use, sale or possession of narcotics, drugs or controlled substances, while on the job, or on NSTAR Electric & Gas Corporation property is a dischargeable offense.
7. Personnel reporting for work in an unfit condition to safely perform assigned work functions shall be immediately dismissed from the work site.
8. Contractors shall properly secure and protect work areas, equipment and materials which could under adverse weather conditions and darkness cause personal injury and/or property damages.
9. Any personal injury, to contractors' employees engaged in work for NSTAR which requires the services of a physician or hospitalization shall be reported at once to the NSTAR Construction Inspector or representative, who shall promptly report the injury to the Report Dispatcher. Any injury to person(s) other than NSTAR or contractors' employees in which circumstances may concern NSTAR shall also be similarly reported.

If the NSTAR Construction Inspector or representative is not at the work site or cannot be easily reached by telephone, the contractor's Competent Person shall give the oral report of the personal injury to the NSTAR Report Dispatcher, telephone (617)541-7888 or 1-800-952-7497.

10. Fighting, horseplay, or other non-work activities by personnel, in the work area, which may adversely effect the safety of people will not be tolerated.

11. Contractors shall conduct their work in a manner that does not introduce hazards to personnel or equipment and offers minimum interference with normal functioning of work sites. Contractors shall not move or cross safety barriers or signs where so installed at NSTAR facilities.

Materials and equipment shall be stored safely in designated areas to provide free access to stairs, passageways, crosswalks, roadways, operating equipment, fire fighting equipment, and the like.

Work areas shall be cleaned up at the end of each day or more often if conditions warrant. Excess backfill material shall be removed promptly with street and sidewalks swept clean.

Penalty for Non-Conformance

Any Contractor or Sub-Contractor who fails to take the necessary safety corrective measures to conform to these safety procedures shall be brought to the attention of the Director of Procurement with a recommendation for one or more of the following remedies with regard to the contractor.

1. Suspension of work in progress.
2. Termination of any and all active contracts.
3. Removal of the contractor from NSTAR's active contractor list.

Michael F. Fleming
Director of Safety and Health Services
March 1, 2004

NSTAR ELECTRIC DELIVERY

CONTRACTS MANAGEMENT GUIDELINES

SECTION II GUIDELINE #1

**Rev. 1
Title: Changes of Scope**

This guideline shall be used for control of scope changes between Contracts Management and its contractors.

Requirements:

Any deviation from the original project as delineated in the first issue of design drawings is considered a "change of scope" and shall be documented as such.

Examples as follows:

New drawings issued for construction

New direction from the client.

New materials.

New work area.

New work hours or workweek.

New scheduled completion dates, which affect the way work is performed.

Each change order shall be review and clearly understood by the Contracts Manager. An estimated cost of the change shall be prepared.

Each change order must identify the impact to the Project schedule. Appropriate adjustment shall be made to the Project schedule to reflect approved changes.

All change will be issued to the contractor by the Contracts Planning Supervisor via a change order transmittal and logged on the attached log sheet.

Applicability:

All changes of scope.

Issued: _____ **Date:** _____
Contracts Manager

Field Change Order Guideline

PURPOSE

This procedure describes the process of providing for and issuing Field Change Orders.

APPLICABILITY

This guideline is applicable to all NSTAR Electric Delivery Project work.

DEFINITION

A field Change Order is a document describing and approving changes in the scope of contracted services.

RESPONSIBILITIES

The Construction Supervisor is responsible for initiating Field Change Orders and for defining and estimating the cost of the extra work.

The Construction supervisor is responsible for the review of all Field Change Orders and for approval of Field Change Orders less than \$5,000.

The Contracts Administrator is responsible for the review of all Field Change Orders and for approval of Field Change Orders over \$5,000 up to but not including \$50,000.

The Contracts Manager is responsible for review and approval of any Field Change Order in excess of \$50,000.

No work shall proceed without written approval and issuance of the Field Change Order. If the contractor elects to proceed without the approval, he does so at his own risk and may be subject to financial penalties including replacement and return to original condition.

PROCEDURE

Field Change Orders are initiated by the Construction Supervisor using the attached Field Change Order form. Complete all information blocks. Indicate the change, drawing reference if applicable, reason for change, and method of payment (T&M, units, fixed price, etc.)

The Construction Supervisor shall approve the form and present it to the assigned contractor for his review and approval. If approved, the contractor must sign the form. If greater than \$5,000 the Contracts Administrator and Contracts Manager must also sign before the change is approved to work.

Each change shall be assigned a log number. The log shall be maintained by the Construction Planning Supervisor. At the conclusion of work, actual costs shall be documented on the form and the Change Order closed.

Invoicing of the Field Change Order shall not be submitted for payment until the Field Change Order is closed. Copies of all Field Change Orders shall be maintained with the Closeout Package.

FIELD CHANGE ORDER

FCO NO.: _____ CONTRACTOR: _____

CITY/TOWN: _____ P.O. / CONTRACT NO.: _____

JOB ORDER #/CONTRACT #: _____ RELEASE # _____

W.O.#: _____ ACCT.#: _____ C.A. _____

ESTIMATED HOURS: LABOR _____ SUPERVISION: _____

1. CHANGE: _____

2. REFERENCE DRAWING NO.: _____

3. REASON FOR CHANGE: _____

4. SCHEDULE IMPACT: YES INCREASE # OF DAYS _____
NO DECREASE # OF DAYS _____

5. METHOD OF PAYMENT: (circle one: T&M, Units, Fixed Price)

APPROVED TO START: _____ DATE: _____
CONSTRUCTION SUPERVISOR

CONTRACTOR DATE: _____

CONTRACTS ADMIN/MANAGER (Greater than \$5,000) DATE: _____

WORK COMPLETE: _____ DATE: _____
CONTRACTOR

ACTUAL HOURS ACTUAL COST

DATE: _____
CONSTRUCTION SUPERVISOR

CLOSEOUT: ACTUAL COST: _____
INVOICE NO. _____

FCO CLOSED: _____
CONSTRUCTION SUPERVISOR

FIELD CHANGE ORDER LOG

[illegible]

Note: FCO/Log number to be issued by Contracts/Planning Supervisor

DOWNTIME AND WAIT TIME

Definition:

Downtime: Downtime is defined as a work stoppage due to unforeseeable events that the contractor and or the owner (NSTAR) could not have predetermined as a blocker and or a stopper of work to be successfully completed (Rain, bad weather and or Acts of God to not qualify as downtime).

Wait time: Wait time is an event caused by the owner that temporarily stops work and is at the direction of an NSTAR representative.

General

It shall be required that the contractor must preview the work environment and schedule the work to minimize any down time and or mitigate any issued that may prevent the smooth flow of work.

Downtime

In the event of a work stoppage due to unforeseeable forces. The contractor shall first, determine if other work within the contract can be accomplished negating any downtime. If it is determined that there is no work other work can be accomplished then the contractor will be due only the effected downtime up to two hours per man, after the initial 4 hours of work up to a total of four hours maximum, at the downtime rate, as determined by the NSTAR field representative. NSTAR will not pay equipment cost for downtime. All downtime cost must be submitted with the original invoice and signed and approved by the NSTAR field representative. NSTAR field representatives may only approve up to a maximum of \$5,000.

If the work is stopped for an indefinite period of time greater than 3 days then the contractor shall be awarded a remobilization charge and an extension of time for completion of work by the total days delayed.

Wait Time

At the direction of an NSTAR representative, or if a crew is required to wait for the completion of work to perform his work due to owner negligence, and the crew is stopped from performing work yet requested to continue after a period of time the contractor shall be awarded the cost of waiting per man per hour, plus the additional cost of overtime cost associated with the extended hours worked to completed his task. NSTAR will not pay for equipment cost during the wait time period.

POSITION

WAIT TIME/DOWNTIME

Straight

Overtime

Project Manager

Foreman

Lineman

Laborer

Remobilization Charge

CONTRACTOR: _____ DATE: _____

INVITATION TO BID

Work Order # 1334405

Please submit a Lump Sum - Not to Exceed price proposal for the following scope of work

PROJECT DESCRIPTION:

Installation and splicing of approximately 7000 ft of cable.

SCOPE OF WORK:

- Rod and rope all ducts as necessary for installation cable
- Install approximately 4 sections, 1570 ft dl of 3-500 CU FS cable
- Install approximately 1 sections, 10 ft dl of 3-#1 AL 15 kV cable
- Install approximately 24 sections, 5325 ft dl of 1-#1 AL 15 kV cable
- Splice 9 -500 FS straight 15 kV joints
- Splice 11-#1 AL 15 kV inline splices
- Splice 30-200 amp 15 kV joints
- Splice 3-600 amp elbows
- Bond all joints and elbows

PRIMARY CABLE INSTALLATION:

From	To	Cable Size	Duct Length
169/105	SB944	3-500 FS	250 ft
SB944	SB945	3-500 FS	410 ft
SB945	SB946	3-500 FS	410 ft
SB946	PMH19728	3-500 FS	<u>500 ft</u>
TOTAL			1570
PMH19727	SB944	3-#1 AL	10 ft
PMH516	SB944	1-#1 AL	180 ft
PMH516	SB944	1-#1 AL	180 ft
SB944	SB945	1-#1 AL	410 ft
SB944	SB945	1-#1 AL	410 ft
SB944	PMH518	1-#1 AL	260 Ft
PMH518	PMH517	1-#1 AL	60 ft
PMH517	SB945	1-#1 AL	150 ft
SB945	SB946	1-#1 AL	410 ft
SB945	PMH519	1-#1 AL	220 ft
SB945	PMH520	1-#1 AL	250 ft
PMH519	SB946	1-#1 AL	190 ft
PMH520	SB946	1-#1 AL	100 ft
SB946	PMH537	1-#1 AL	300 ft
SB946	PMH538	1-#1 AL	300 ft
PMH538	PMH536	1-#1 AL	310 ft
PMH536	PMH535	1-#1 AL	260 ft
PMH537	PMH535	1-#1 AL	350 ft
SB946	PMH19728	1-#1 AL	500 ft
SB946	PMH521	1-#1 AL	180 ft
SB946	PMH522	1-#1 AL	185 ft

PMH521	PMH19728	1-#1 AL	320 ft
PMH522	PMH523	1-#1 AL	140 ft
PMH523	PMH19728	1-#1 AL	<u>170 ft</u>
TOTAL			5325 ft

SECONDARY CABLE INSTALLATION:

Location	Cable Size	No. of Sets	Duct Length
PMH516	3x4/0	4	5 ft
PMH517	3x4/0	2	5 ft
PMH518	3x4/0	3	5 ft
PMH519	3x4/0	4	5 ft
PMH520	3x4/0	3	5ft
PMH521	3x4/0	4	5 ft
PMH522	3x4/0	4	5 ft
PMH523	3x4/0	1	5 ft
PMH535	3x4/0	2	5 ft
PMH536	3x4/0	3	5 ft
PMH537	3x4/0	3	5 ft
PMH538	3x4/0	3	5 ft

SPLICING:

Location	Splicing
SB944	3-500 15 kV straight joints
SB944	4- #1AL 15 kV inline joints
PMH19727	3-200 amp elbows
PMH516	2-200 amp elbows
PMH518	2-200 amp elbows
PMH517	2-200 amp elbows
SB945	3-500 15 kV straight joints
SB945	3- #1AL 15 kV inline joints
PMH519	2-200 amp elbows
PMH520	2-200 amp elbows
SB946	3-500 15 kV straight joints
SB946	4- #1AL 15 kV inline joints
PMH538	2-200 amp elbows
PMH537	2-200 amp elbows
PMH536	2-200 amp elbows
PMH535	2-200 amp elbows
PMH521	2-200 amp elbows
PMH522	2-200 amp elbows
PMH523	2-200 amp elbows
PMH19728	3-200 amp elbows
PMH19728	3-600 amp elbows

Summary:

9-500 15 kV straight joints
11- #1AL 15 kV inline joints
30 – 200 amp elbows
3-600 amp elbow

PROVIDED BY NSTAR:

- Associated design drawings and work orders
- Field lookup and cable identification of the installed cable
- Access to NSTAR's manhole system through contact with the responsible Contract Technical Representative (CTR) or designated employee.

- NSTAR shall provide all permanent system materials: cable, splicing kits, porcelains, cable support system, etc. The material will be delivered to the contractor's secured staging area.
- Local and state permits for the work and work location. (Later)
- Public Works Department – Conditions for Winter Work
- Field Change Order Forms
- NSTAR will provide overhead resources to complete the riser work on pole 169/105. Contractor to pull in riser section and leave riser cable coiled up at top of standpipe.
- NSTAR will manage and dispose of all hazardous material encountered during construction.

PROVIDED BY CONTRACTOR:

- Provide all labor, supervision and equipment to ensure the safety of personnel and existing operating electrical systems. All personnel must demonstrate experience and knowledge of the work and work environment prior to assignment to the project.
- The contractor will be responsible for cleanup and proper disposal of all debris associated with their work. This includes clearing manholes of all debris, including any necessary staging or platforms.
- The contractor will be responsible for returning any re-usable stock to the Waltham stockroom
- Restoration of all disturbed areas to as found or better condition.. This will include but not be limited to:
 - Restoration of lawns with good quality loam and seed
 - Restoration of shrubs/trees/fences, etc., with same quality & type replacements
- Security of all materials and equipment at the jobsite. Contractor will be responsible for replacement of any missing NSTAR stock that was delivered to the staging area.
- The contractor will be responsible for contacting Dig Safe, Mass Highway Department, Town, Water and Sewer departments and the DPW for street opening permits if necessary.
- The contractor will be responsible for following Dig Safe Guidelines.
- The contractor will complete NSTAR cable and equipment field report forms and forward to the Contract Technical Representative.
- NSTAR will provide forms to be completed by the contractor for the as-built installation of cable and equipment. Completion and submittal of these forms to the NSTAR CTR person are mandatory for invoice payment.
- Police details – The contractor will be responsible for the coordination, cost and payment of police details necessary to comply with state and local requirements. Contractor must provide their own police detail slips.
- Designated Competent Person in accordance with OSHA requirements.

RFP SPECIFICATIONS:

- Dimension of cable lengths between manholes are approximate and are the responsibility of the Contractor to prove accurate
- Contractor shall rod and rope all ducts as necessary to facilitate cable installation.
- Verify duct lengths and cable slack in each manhole before cutting cables. Any cut cables that are too short will be applied to the Contractor's account. This includes riser sections.
- All plant materials – material must meet NSTAR design requirements and specifications.
- Hourly rates for all personnel and equipment must be submitted as part of this proposal.
- All cable will be keno tested prior to acceptance. Any cable that fails the test due to being damaged during installation will be replaced at the expense of the contractor. The cost of the cable will be born by the contractor.
- Working live caps are to be installed at each end of spliced cable runs for Kenetron testing.
- After the cutover of the new cable, NSTAR resources will identify and cut old cable to be removed by the contractor.
- Any joint that fails Kenetron testing will be remade at the expense of the contractor.
- Any duct problems encountered will be repaired by NSTAR
- 1/0 cu bond frame is to be installed at every manhole; entrance and exit duct mouths
- Contractor will install all required stanchions, hangers and porcelains; material supplied by NSTAR
- All unused material will be returned to the NSTAR Waltham Service Center stockroom.
- The contractor will clean all manholes upon completion of their work.

- All work zones shall be MUTCD compliant to ensure the safety of vehicular and pedestrian traffic during construction activities
- All installed cable will be arc proofed, duct-to-duct, and tagged by the contractor. The CI will prepare the cable tag.
- The contractor shall be financially responsible for repairing all equipment and/or property damaged during the job by the contractor
- Secondary cables to made up in new transformer and ends sealed in old transformer for future cutover by NSTAR.
- Contractor shall dispose of all removed materials.
- Contractor shall warranty all work for a minimum of one year including, but not limited to, cable/electrical equipment failure resulting from installation damage or deficiencies. Warranty will also apply to any landscape restoration efforts.
- Contractor shall erect and remove platforms and staging as necessary to access jointing area
- Contractor will attend weekly construction meeting to be held at the Waltham Service Center. Contractor will provide current updates of construction status including cable pulling, splicing and field reports.
- All work shall be coordinated with customer's agent.
- No disruption of service will be allowed unless approved in advance by the supervisor.
- All outage notifications will be conducted at least one week in advance of planned outage.
- NSTAR is not responsible for delays incurred by police details, regulatory groups that provide permits, dig permits or authorizations to proceed.
- Work hours will be 7AM to 3:30PM unless otherwise directed by NSTAR CTR.

RFP SPECIFICATIONS

No work shall be done on Saturdays, Sundays or Holidays unless approved by the NSTAR's Construction Supervisor.

January 1	New Year's Day
January 19	Martin Luther King Jr. Day (Local 12004 employees only)
February 16	President's Day
April 19	Patriot's Day
May 31	Memorial Day
July 5	Independence Day
September 6	Labor Day
October 11	Columbus Day
November 11	Veterans Day
November 25	Thanksgiving Day
December 25	Christmas Day

Any discrepancies or omissions found in the request for proposal including Work Order Tasks, drawings, and specifications shall be reported to NSTAR prior to submittal of bids.

STANDARDS OF CONSTRUCTION:

~~All overhead and underground construction shall be in accordance with current NSTAR Construction Standards and Work Method Standards. These documents may be obtained through Janine Menard at (781) 441-3978.~~

The following standards of construction have been noted for their applicability to this project:

WMS 2.1-8.3 Installation of 15 kV, 200 amp, Premolded Joints for #2 AWG, XLPE or EPR, Concentric Neutral Cable

C1700 Heat Shrink Joint for Flat Strap (FS) Neutral Cable, Rated 15KV

W5000 Working on Distribution Circuits, Network Feeders and Distribution Supply Lines

WMS2.9-1.1 Cable Pulling Operations

C2012 Construction and Installation of 200 Amp Load Break Elbow Terminations for 15/25kV Pad Mounted Equipment

C2018 Installation of 15 & 25 kV, 600 amp, T-OP 11 Deadbreak Elbows for EPR Flat Strap Neutral Cables

C3800 INSTALLATION OF S&C FUSED, PADMOUNTED, VISIBLE BREAK, AIR SWITCH RATED 15 & 25kV, 600 AMP, MANUAL OR MOTOR-OPERATED (INCLUDING RADSEC) (PME-9)

POLICIES AND PROCEDURES:

All overhead and underground construction shall be in accordance with current NSTAR Safety Procedures, NSTAR Operating Procedures as well as all applicable Federal, State and Local safety requirements. NSTAR documents may be obtained through Janine Menard at (781) 441-3978.

Please note the following specific requirements:

Before any person is authorized to enter the existing NSTAR manhole system, which contains primary circuits operating at 2.4kV or above, the NSTAR responsible person must notify the System Dispatcher and receive approval. At the end of work in the system, the System Dispatcher must also be notified that the manhole is clear. Contractors are not authorized to enter this system without this notification. Refer to OPI.1-2D.

After authorization to enter the manhole system has been received and before any work shall be performed, the contractor shall make an inspection of all equipment in the manhole and identify any faults or potential hazards to him or the environment. If any are found he shall immediately remove himself from the manhole and notify the responsible NSTAR representative and his supervisor and wait for direction.

INVOICING:

All original invoices must be submitted to:

Accounts Payable
NSTAR Electric & Gas Corporation
P.O. Box 250
Norwood, MA 02065-0250

A copy of each invoice will be sent to Thomas Morahan at the Waltham Service Center.

Invoices must include Name, Job Location, Contract Number, Work Order Number & Tasks, Circuit (if applicable). Appropriate back-up information, approved by the Contract Technical Representative, must be provided for payment authorization, i.e. time sheets, work reports, etc.

Contract Technical Representative (CTR): Tom Schlehuber, phone # 339-987-7849 (cell)

CONTRACTOR _____

DATE _____

RFP COST BREAKDOWN

Itemize your cost for police details and include it in your lump sum.

POLICE DETAIL \$ _____ TOTAL LUMP SUM \$ _____

Contractors are not permitted to perform any work outside the scope of this document without prior written approval from the CTR (up to \$5,000) and/or the Procurement Department (over \$5,000).

Supplemental Units of Construction:

<i>Item</i>	<i>Unit of Measure</i>	<i>Cost per Unit</i>
Construct 500CU 15kv straight joint	Each	
Construct #1 AL 15kv inline joint	Each	
Construct 200 Amp Elbow	Each	
Construct 600 Amp Elbow	Each	
Install #1 AL Cable	/ft	
Install 500 CU FS Cable	/ft	
Install 3x4/0 CU Secondary Cable	/ft	

Note:
NSTAR prefers that whenever possible cable is pulled through manholes rather than spliced. NSTAR CTR person or Inspectors will make the determination if a manhole will be pulled through.

THE SUPPLEMENTAL COST IDENTIFIED ABOVE WILL BE USED AS THE CREDIT VALUE FOR DEFERRED SPLICING.

IMPORTANT DATES:

Pre-bid Meeting: APRIL 7TH, 2004
Bids Due: APRIL 23TH NOON
Start Date: JUNE 1, 2004
Completion Date: JULY 16, 2004

Estimated Work Duration: 4 Weeks



NSTAR Electric & Gas Corporation

Final Contract

Contract: 00018208
Release :
Executed: 05/04/04
Printed : 05/04/04
Page : 1

Mail Invoice To:

Accounts Payable (781)441-8363
NSTAR Electric&Gas Corp, Agent
PO Box 250
Norwood MA 02062-0250

Vendor:

Stephen P. Martin
ELECCOMM CORPORATION
155P NEW BOSTON STREET
WOBURN MA 01801

Please Direct Inquiries to:

SUSAN RICHARDS

Title: SR CONTRACTS AGENT

Phone: 781 441-8521

Ext:

Fax : 781 441-8503

NSTAR Electric & Gas Corp agent for

Boston Edison Company

Title: WALTHAM-STEARN'S HILL (WINDSOR VILLAGE) - CABLE.

Total Value : [REDACTED]
Pricing Method: LUMP SUM FIXED PRICE

** NOT TO EXCEED **

Contract Type : STANDARD CONTRACT
Project : 01287

Start Date: 05/04/04
End Date : 06/01/04

Stephen P. Martin
Vendor Authorized Signature

Stephen P. Martin / Principal
Printed Name/Title

5-10-04 *781 933-8394*
Date Signed Phone


Susan Richards
Authorized Signature

SUSAN RICHARDS, SENIOR CONTRACT AGENT

Printed Name/Title

5/4/04 *781-441-8521*
Date Signed Phone

* * * End of Contract * * *

	CONTRACT NO: 18208 RELEASE NO: AMENDMENT:
Procurement Mail Stop SE250 One NSTAR Way Westwood MA 02090	ELECCOMM

IN ORDER TO ENSURE TIMELY PAYMENTS FOR THE GOODS AND SERVICES PROVIDED UNDER THIS CONTRACT, IT IS IMPERATIVE THAT ALL INVOICES ISSUED BY YOUR COMPANY NOW REFERENCE THE ABOVE CONTRACT AND RELEASE NUMBER. FAILURE TO REFERENCE THESE NUMBERS MAY RESULT IN LATE PAYMENT OR REJECTION OF INVOICES.

SCOPE OF WORK:

Stearns Hill (Windsor Village)-Cable, Waltham

Work Order # 1334405

PROJECT DESCRIPTION:

Installation and splicing of approximately 7000 ft of cable.

SCOPE OF WORK:

- Rod and rope all ducts as necessary for installation cable
- Install approximately 4 sections, 1570 ft dl of 3-500 CU FS cable
- Install approximately 1 sections, 10 ft dl of 3-#1 AL 15 kV cable
- Install approximately 24 sections, 5325 ft dl of 1-#1 AL 15 kV cable
- Splice 9 -500 FS straight 15 kV joints
- Splice 11-#1 AL 15 kV inline splices
- Splice 30-200 amp 15 kV joints
- Splice 3-600 amp elbows
- Bond all joints and elbows

THE ABOVE SCOPE OF WORK IS NOT TO EXCEED [REDACTED] WITHOUT PRIOR WRITTEN AUTHORIZATION.

PER RFP# 872 , E-MAILS AND AMENDMENTS AND YOUR QUOTATION DATED 4/23/04


AGREEMENT PERIOD: 5/4/04 – 7/16/04

IT IS THE INTENT OF THIS CONTRACT THAT THE RELATIONSHIP OF THE OWNER AND CONTRACTOR BE THAT OF "OWNER AND INDEPENDENT CONTRACTOR." THE MEANS AND METHODS EMPLOYED FOR PERFORMING THE DETAILS OF THE WORK SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

TERMS AND CONDITIONS OF THIS CONTRACT ARE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF CONSTRUCTION BY AND BETWEEN NSTAR ELECTRIC AND GAS CORPORATION AND IT'S AFFILIATES AND ELECCOMM.

ALL WORK SHALL BE IN ACCORDANCE WITH NSTAR'S SAFETY RULES FOR CONTRACTORS AND SUB-CONTRACTORS WORKING ON NSTAR ELECTRIC & GAS CORPORATION SYSTEM AND FACILITIES. Rev. 3/1/04.

ALL WORK SHALL BE IN ACCORDANCE WITH NSTAR'S CONSTRUCTION SOIL MANAGEMENT SPECIFICATION Rev. 1, 4/9/04.

	CONTRACT NO: 18208 RELEASE NO: AMENDMENT:
Procurement Mail Stop SE250 One NSTAR Way Westwood MA 02090	ELECCOMM

ACCEPTANCE OF CONTRACT

IF SUPPLIER FAILS TO EITHER REJECT OR EXECUTE THIS CONTRACT, CONTRACT RELEASE OR AMENDMENT THERETO (THE CONTRACT), THEN THIS CONTRACT SHALL BECOME BINDING WHEN ACCEPTED BY THE SUPPLIER. PERFORMANCE BY THE SUPPLIER UNDER A CONTRACT SHALL CONSTITUTE ACCEPTANCE OF THAT CONTRACT. MODIFICATIONS, SUBSTITUTIONS OR CONDITIONS STATED BY THE SUPPLIER IN ACCEPTING OR ACKNOWLEDGING THIS CONTRACT, WHETHER IN CONFLICT WITH OR IN ADDITION TO THE TERMS AND CONDITIONS SET FORTH HEREIN, SHALL NOT BE BINDING UPON THE COMPANY, UNLESS SPECIFICALLY ACCEPTED IN WRITING BY THE COMPANY'S PROCUREMENT DEPARTMENT. IF THIS CONTRACT HAS BEEN ISSUED IN RESPONSE TO SUPPLIER'S PROPOSAL, THEN ISSUANCE OF THIS CONTRACT SHALL CONSTITUTE AN ACCEPTANCE OF SUCH PROPOSAL, BUT SUBJECT TO THE EXPRESS CONDITION THAT THE SUPPLIER ASSENT TO ANY ADDITIONAL OR DIFFERENT TERMS HEREIN, REGARDLESS OF WHETHER PERFORMANCE HAD PREVIOUSLY BEGUN. SUPPLIER SHALL BE DEEMED TO HAVE SO ASSENTED, UNLESS SUPPLIER NOTIFIED THE COMPANY TO THE CONTRARY WITHIN TEN (10) DAYS OF THE DATE OF ISSUANCE OF THIS CONTRACT.

THE TYPES AND LIMITS OF YOUR INSURANCE CERTIFICATES OF WHICH ARE ON FILE WITH OUR INSURANCE DEPARTMENT ARE SATISFACTORY AND SHALL REMAIN IN FORCE FOR THE DURATION OF THE CONTRACT.

THE CONTRACTOR SHALL MAKE ALL STATUTORY REQUIRED PAYMENTS BY THE STATE AND FEDERAL AUTHORITIES FOR ALL PERSONS UTILIZED BY THE CONTRACTOR IN THE EXECUTION OF THE CONTRACT WORK AND SHALL, ON REQUEST, PROVIDE EVIDENCE OF SUCH PAYMENTS FOR THE ABOVE MENTIONED ITEMS.

INSTRUCTIONS TO VENDOR TO CHARGE SALES TAX

MASSACHUSETTS LAWS REQUIRE THAT NSTAR ELECTRIC/GAS PAY A 5% SALES TAX ON ALL MATERIALS SUCH AS BUILDING MATERIALS, CONSUMABLES, TOOLS, FENCING, PAINTING, ETC. (EXCEPT THOSE MATERIALS USED DIRECTLY IN THE GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRICITY), AND ON CERTAIN SERVICES INCLUDING PAVING AND EQUIPMENT RENTALS.

PLEASE ENSURE THAT ALL INVOICES TO NSTAR ELECTRIC/GAS INCLUDE ACCURATE MASSACHUSETTS SALES TAX AMOUNTS FOR THE ABOVE ITEMS OR THEY WILL NOT BE PROCESSED.

NSTAR ELECTRIC/GAS PAYS ALL SALES TAXES TO VENDORS AND DOES NOT MAKE TAX PAYMENTS DIRECTLY TO THE MASSACHUSETTS DEPARTMENT OF REVENUE AS WE MAY HAVE IN THE PAST.

THEREFORE, IT IS IMPERATIVE THAT VENDOR INVOICING INCLUDE ACCURATE SALES TAX AMOUNTS. IF YOU HAVE ANY QUESTIONS OR CANNOT BILL THE TAX BECAUSE YOU ARE NOT REGISTERED TO CONDUCT BUSINESS IN THE COMMONWEALTH OF MASSACHUSETTS, PLEASE CONTACT THE BUYER OR AGENT NAMED ON THIS CONTRACT.

ACCOUNTS PAYABLE ISSUES:

Send all invoices to: NSTAR Electric and Gas Corporation
ATTN: Accounts Payable
PO Box 250
Norwood MA 02062
(781) 441-8363

W/O# 1151354

Work Location: Stearns Hill Rd.

City: Waltham

Circuit# 450-H1, 450-H4

Date: 08/21/03

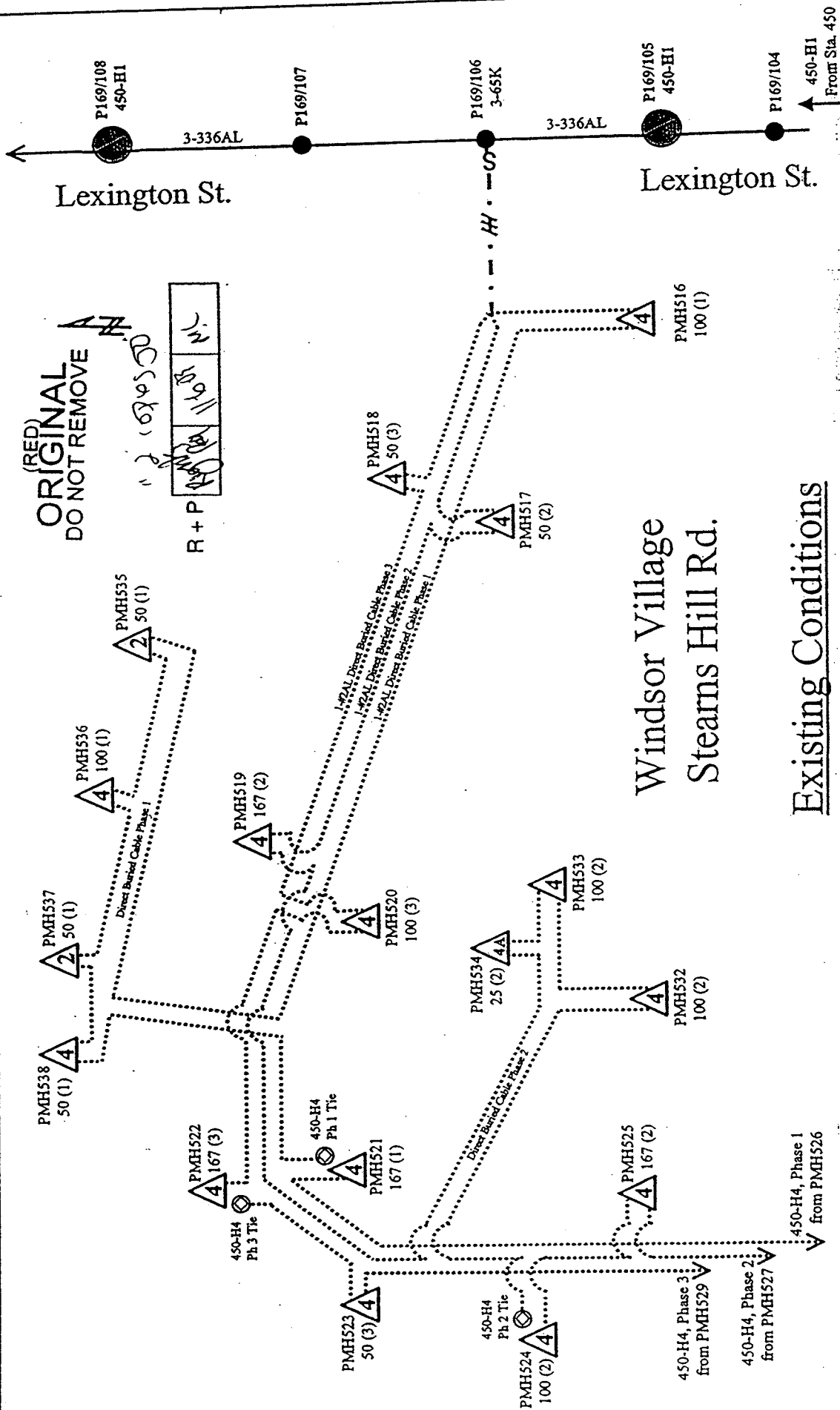


Page 1 of 6

Work Description: Replace existing Direct Buried Primary Cable with new Conduit System.

Install new PME-9 Switch, new Cable Switching Station, new Recloser and new Splice Boxes.

This is part 1 of a 2 part conversion plan. (Part 2 to be done in 2004)

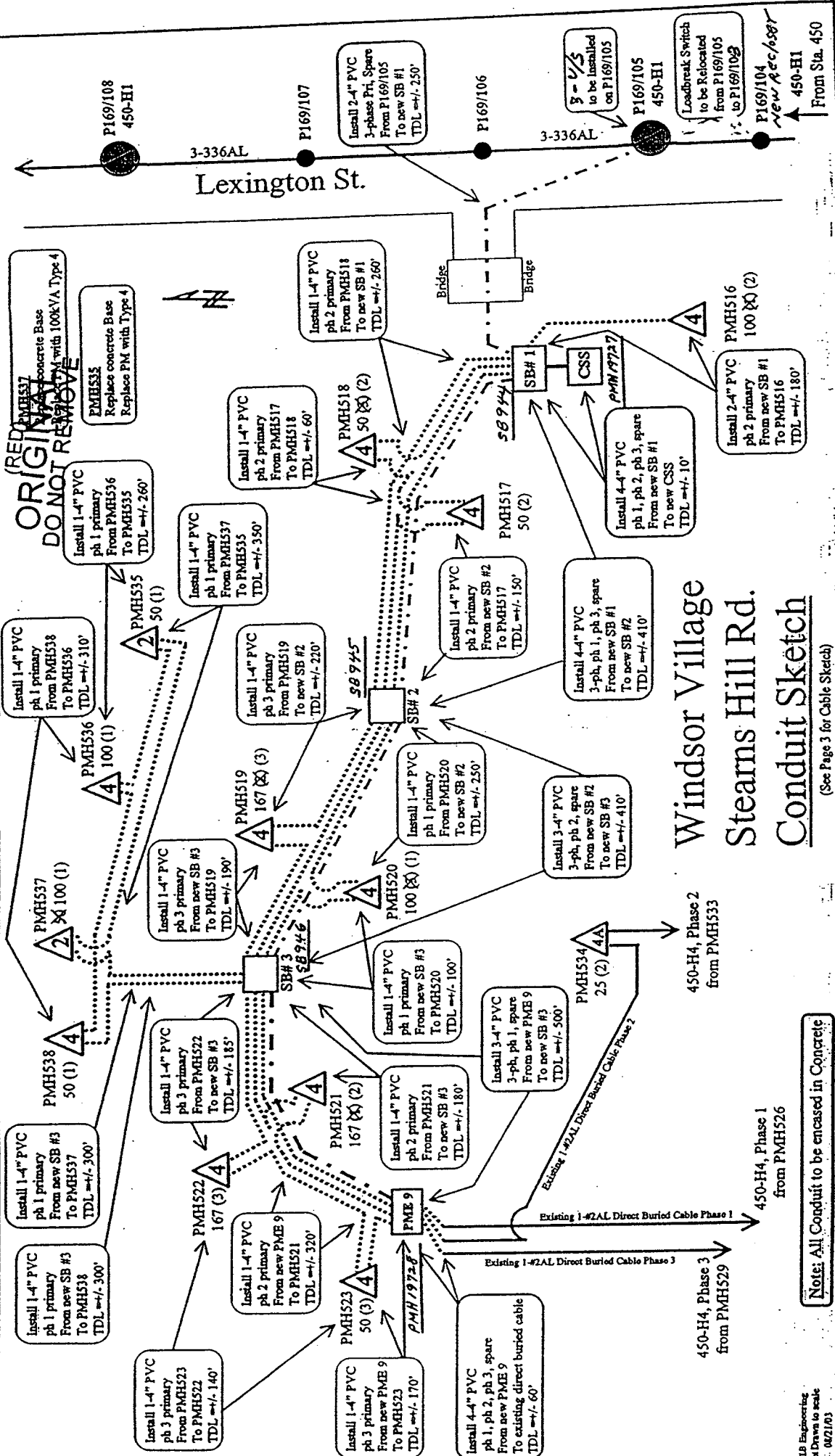


Existing Conditions

Work Description: Replace existing Direct Buried Primary Cable with new Conduit System.
Install new PME-9 Switch, new Cable Switching Station, new Recloser and new Splice Boxes.
This is part 1 of a 2 part conversion plan. (Part 2 to be done in 2004)

Work Location: Stearns Hill Rd. City: Waltham
Date: 08/21/03
Circuit# 450-H1, 450-H4
NSTAR ELECTRIC
Page 2 of 6

Work Description: Replace existing Direct Buried Primary Cable with new Conduit System.
Install new PME-9 Switch, new Cable Switching Station, new Recloser and new Splice Boxes.
This is part 1 of a 2 part conversion plan. (Part 2 to be done in 2004)

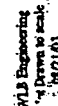


Note: All Conduit to be encased in Concrete

WLB Engineering
Not Drawn to scale
8/21/03

4-29-68

This is part 1 of a 2 part conversion plan. (Part 2 to be done in 2004)



Notes: Install Fault Indicators where indicated
Cut and Abandon existing Dir Bur Cable.

W/O# 1151354

Work Location: Stearns Hill Rd.

City: Waltham

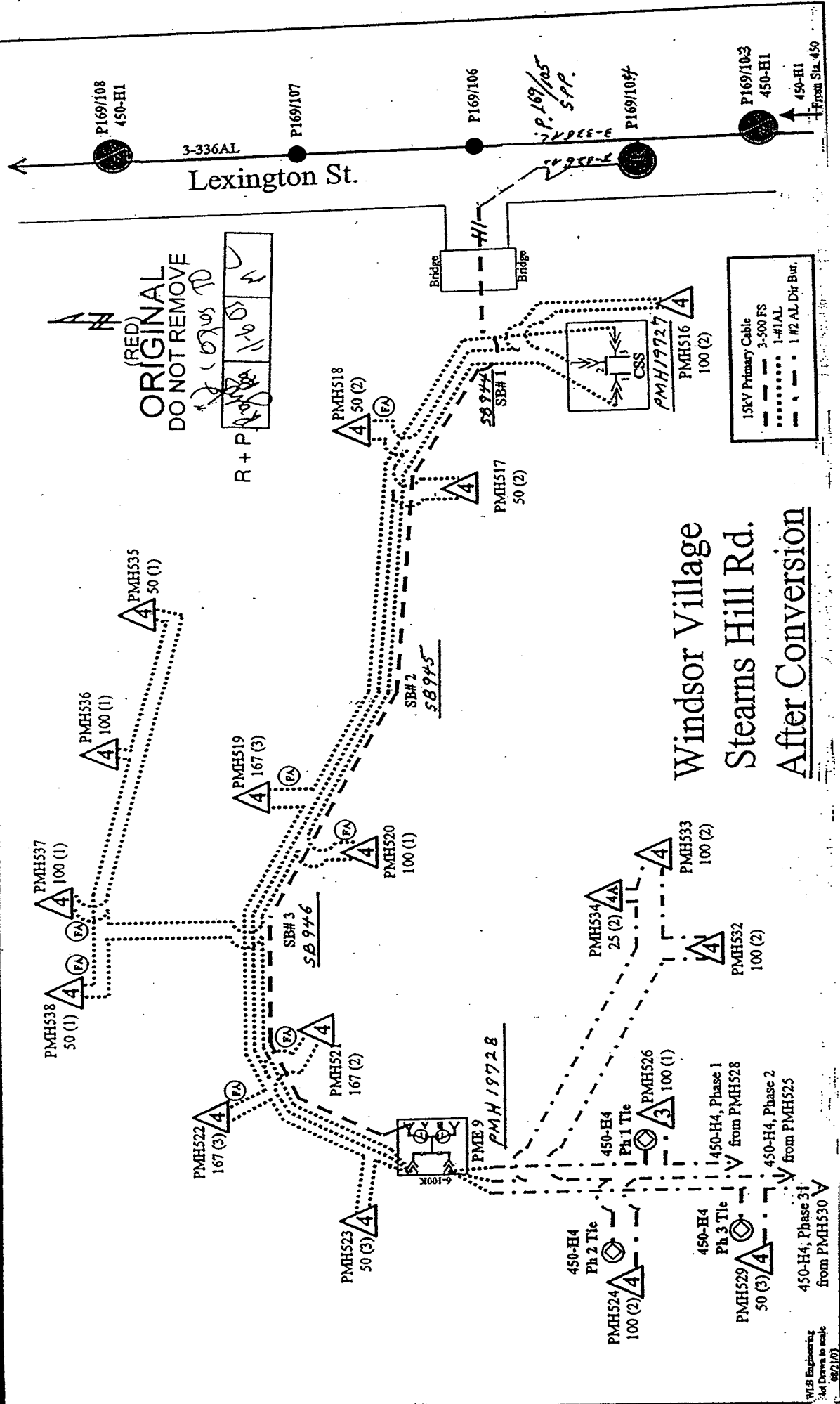
Circuit# 450-H1, 450-H4

Date: 08/21/03



Page 4 of 6

Work Description: Replace existing Direct Buried Primary Cable with new Conduit System.
Install new PME-9 Switch, new Cable Switching Station, new Recloser and new Splice Boxes.
This is part 1 of a 2 part conversion plan. (Part 2 to be done in 2004)



NOTE:

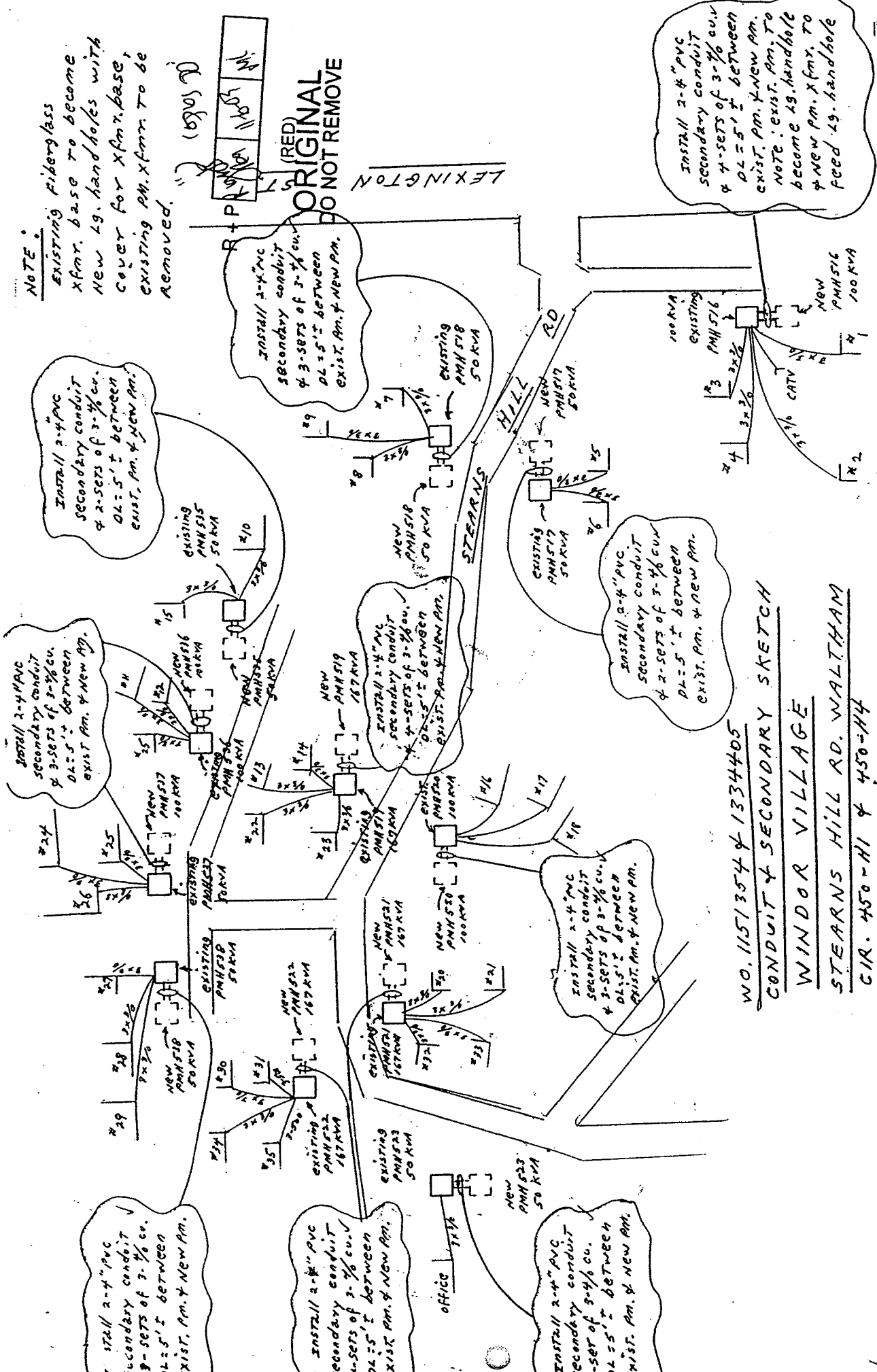
EXISTING FIBERGLASS
XPMR. BASE TO BECOME
NEW LG. HANDHOLES WITH
COVER FOR XPMR. BASE,
EXISTING PM. XPMR. TO BE
REMOVED.

(670) 30



(RED)
ORIGINAL
DO NOT REMOVE

LEXINGTON



INSTALL 2-4" PVC
SECONDARY CONDUIT
4-SETS OF 3-1/2" cu.
DL = 5' ± BETWEEN
EXIST. PM. & NEW PM.
NOTE: EXIST. PM. TO
BECOME LG. HANDHOLE
4 NEW PM. XPMR. TO
FEED LG. HANDHOLE

WO. 115/354 & 1334405
CONDUIT & SECONDARY SKETCH
WINDOR VILLAGE
STEARNS HILL RD. WALTHAM
CIR. 450-H1 & 450-H4

(RED)
ORIGINAL
DO NOT REMOVE

R + P
11 2 (690) JD
11 13 11V

STEARNS HILL RD

169/104
REPLACE Pole with 50'CL
(5/6 NSTAR) & REMOVE
40'CL Pole (5/6 NSTAR SET 1953)

INSTALL Line RECLOSER
& 6-13.8KV L/S
AS SHOWN
CIR. 450-HI

169/103
REPLACE Pole with 45'CL
(5/6 NSTAR) & REMOVE
40'CL Pole (5/6 NSTAR SET 1953)

INSTALL New Load Break
LINE SWITCH & 6-13.8KV L/S
CIR. 450-HI

169/104
REPLACE Pole with 50'CL
(5/6 NSTAR) & REMOVE
40'CL Pole (5/6 NSTAR SET 1953)

REMOVE Load Break L/S
LINE SWITCH & 13.8KV L/S
INSTALL NEW 3-underswing
& 3-13.8KV RISER L/S &
MAKE TERMINATIONS
FOR NEW R+P RISER

NEW SPP

NEW 3-500KV PS.

NEW
(R)

LEXINGTON

NEW

10'

97'

NEW SPP

NEW 3-500KV PS.

3-65K

ST.

LE

169/107

169/106

SPP

SPP 169/106

REMOVE EXISTING 3-12 K. PRIMARY
RISER & 3-65K PUSE. C/S,
& 3-13.8KV L/S
AFTER WINDSOK VILLAGE
BEEN COMPLETED ON
WO. 1151354 & WO. 1334403

169/105

169/104

UNDER BUILD
INSTALL 3-336AL Pri. WIRES
FROM Pole 169/104 TO Pole 169/105

97 CF, 1-SECTION
AS SHOWN, CIR. 450-HI

22 AL
DOLORES AVE



UG 1 TRAINING PROGRAM

CRAFT & COMPLIANCE

Underground Lineworker Progression

Job Classification	Prerequisites	Classroom	Field Work	Comments
UG Lineworker Class 3	½ day pre-screening.	3 weeks	1 year field training.	Entry-level position. In addition students will obtain a hoisting license and appropriate Class B drivers license.
UG Lineworker Class 2-Part I		2 weeks UG Lineworker Part I	2 weeks (as 3 rd person) 15 weeks on the job training.	Fieldwork is monitored using the UG 2 Part I Field Evaluation Sheets, which consists of 17 tasks.
UG Lineworker Class 2-Part II	UG 2 Part I Field Evaluation Sheet Must Be Completed.	2 weeks UG Lineworker Part II	2 week (as 3 rd person) 7 weeks with a Splicer 20 weeks field work 12 additional weeks at Mass Ave	Fieldwork is monitored using the UG 2 Part II Field Evaluation Sheets, which consists of 21 tasks.
UG Lineworker Class I	UG 2 Part II Field Evaluation Sheet Must Be Completed	4 weeks*	2 weeks as a 3 rd person	
Troubleshooter	Must Be Fully Trained UG I for 5 years to qualify	2 day review	6 months with a Troublemaker 6 weeks with an inspector	Troubleshooters are posted at needed by the Division
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment and procedures review.

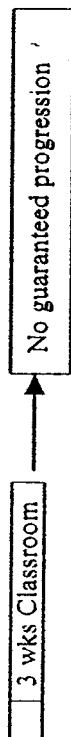
*Approximately 60 weeks to become a fully qualified UG I.

The above chart details cable/conduit personnel training program to Splicer.

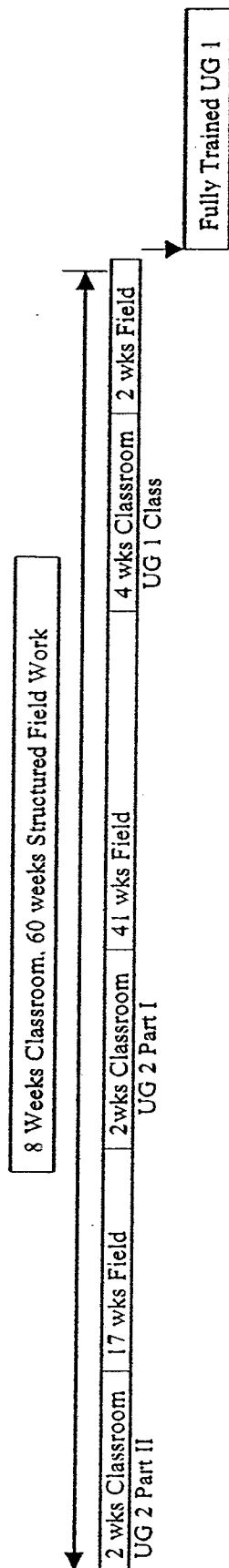
A written test is required at each level. Tests are not included in the training materials package but can be furnished upon request.

Underground Lineworker Progression

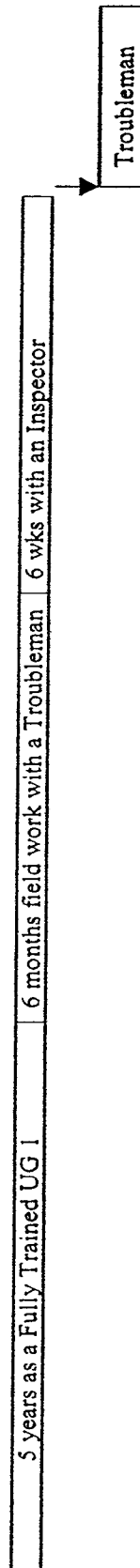
UG Lineworker Class 3



UG Lineworker Class 2 to Class 1



UG 1 to Troubleman (Troubleman Jobs Are Posted As Needed)

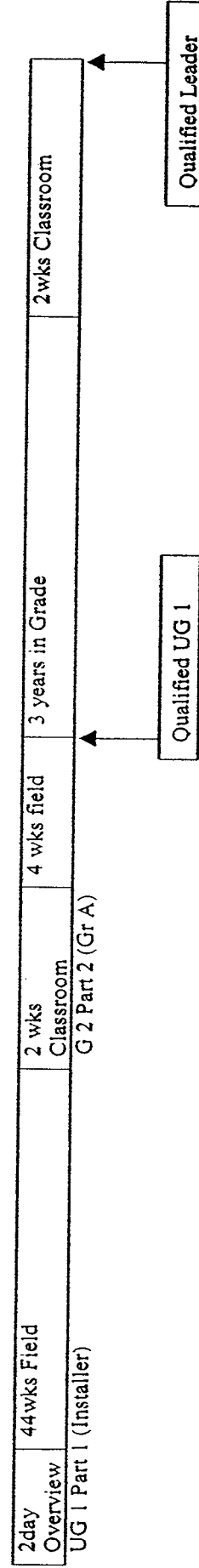


Underground Lineworker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part I (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 5 th person on a cable crew, 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work. 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review, New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.



UG LINEWORKER CLASS 1

(THIS OUTLINE HAS BEEN UPDATED ON 01/06/03)

Day 1

- * Review 4 week classroom work
- * Annual compliance training

Day 2

- * Review system voltages
- * Hands-on review:
 - inline splice [CS2.1-8.3 "Installation of 15kV 200 Amp Premolded Joints for #2 AWG XLP or EPR, Concentric Neutral Cable"]
 - 200 Amp Elbow Padmount C2012
 - 200 Amp Elbow Manhole C2015

Day 3

- * Prove 5kV lead joint de-energized and break down
- * Sweat connector and make 5kV heat shrink straight [CS2.1-3.24 "5kV Heat Shrink Splice"]

Day 4

- * Ohm's Law
- * Prove 5kV heat shrink straight de-energized and break down
- * Vee out copper connector and sweat for multiple joint
- * Construct 5kV heat shrink multiple [CS2.1-9.23 "5kV Heat Shrink Joint for Single-Multiple and Double-Multiple Power Cables"]

Day 5

- * Transformer theory -T0930
- * Complete 5kV multiple joint
- * Construct 5kV live end cap [C2011]

Day 6

- * Review test instruments
- * Secondary connections: single phase; 3 phase
- * Use of secondary jumpers
- * Banking

Day 7

- * Seven wire mains
- * Limiters
- * Picking out pairs

Day 8

- * Transformer connections
- * Banking transformers
- * Transformer ratings

Day 9

- * Live phasing
- * Low tension phasing

- * Phone out cables
- * Timco Impulse Phaser (T0035)

Day 10

- * Construct 15kV heat shrink straight [C1700]
- * Manhole bonding - crimp connector, sweat connectors and break down heat shrink straight

Day 11

- * Construct 15kV heat shrink multiple [C1730]
- * Review transformer theory

Day 12

- * Review voltages
- * Construct 15kV heat shrink termination [CS2.7-4.22]
- * Construct 15kV live end cap [C2000]

Day 13

- * Review test instruments
- * Boil out cable (test for moisture)
- * Construct 15kV single 3 way splice [C1710]

Day 14

- * Finish single 3 way splice
- * Construct 15kV 3 conductor live end cap [C2019]

Day 15

- * Tagging lines and circuits
- * Construct 600 amp elbow [C2.10-10.24]

Day 16

- * SCADA tour
- * Construct network transformer elastimold splice [CS2.10-10.27]
- * Racking cable in manhole

Day 17

- * Review voltages and transformers
- * Begin heat shrink 3 conductor splice

Day 18

- * complete 3 conductor splice

Day 19

- * Review

Day 20

- * Test - written; hands-on

POSITION PROFILE

Title:	UG Lineworker Class 1	Organization:	Electric Operations
Reports To:	Supervisor	Department:	Various
Date:	May 9, 2000	Area:	Various
Job Code:			

Role and Scope of Position:

- Responsible for the inspecting, installing, connecting, disconnecting, and repairing of cable, conductors, and other plant and equipment.
- Directs and trains employees of an equal or lower rating.
- Works under general supervision.
- Works under directive supervision when installing cable or equipment.

1. Essential Functions:

- Makes all types of splices and connections involved in the installation, maintenance and repair of plant and equipment.
- Performs all functions associated with cable & conduit installation.
- Operates trucks and equipment of any size in conjunction with inspecting, installing, connecting, disconnecting and repair of cable, conductors, and other plant and equipment
- Can assist or be assisted by personnel of a higher, equal, or lower rating for all tasks within the line of progression.

3. Accountability/Impact of Position:

- Accountable for all personal and crew/team performance consistent with company standards
- Responsible for the safe conduct of all employees within their work team/crew.
- Responsible for displaying a positive company image with respect to customers and community.
- Responsible for providing accurate & timely information with respect to customer service.
- Responsible for maintaining a positive work environment by behaving and communicating in a professional manner that fosters good relationships with customers, clients, co-workers and supervisors.

4. Technical Knowledge/Skill/Education/Licenses/Certifications: (What do incumbents need to know to

Technical Knowledge/Skill:

- Must have a working knowledge of: The fundamentals of electricity, the layout, functions and construction of the Company's underground electric system, and the theory and practices of splicing, the standards and specifications for installation, maintenance, removal and repair of the underground electric system; the practices, principles of operations and the proper applications of equipment as prescribed by the Company for safety and first aid.

Education: High School Education or equivalent

Experience:

- Must be qualified by experience on lower grade assignments in cable and conduit and splicing work.
- Must have demonstrated an interest in and aptitude for splicing, cable, and conduit work and ability in underground electric systems.

Licenses & Certifications: Massachusetts License to Operate Motor Vehicles Class A

Illustrative duties: In addition to the duties of an UG Lineworker Class 2, performs the following: makes all types of splices and connections, installs terminals and cable pulling eyes, insulates, joints, duct splices, racks, cuts, wipes, bonds and lead burns underground and aerial cables of all types for operation at voltages up to and including 345,000 volts in accordance with prescribed standards and specifications on the Company system and on customers' premises; assembles underground transmission, distribution and street lighting equipment for operation at voltages up to and including 345,000 volts in the shop or field; phases primaries of distribution circuits for multiple operation and secondaries of two or three single-phase transformers for three-phase operation; identifies, by test, the phases of transmission and distribution system supply circuits; participates in the identification of phases in energized distribution circuits; wipes and unwipes joints; cuts, insulates, and identifies conductors energized at distribution voltages within prescribed limitations; connects and disconnects portable transformer banks; makes necessary tests to prove that cables and conductors are de-energized on circuits operating above 600 volts; applies standards, operating procedures and safe operating practices without reference to notes on work of a recurring nature; operates and adjusts winches and derricks which are part of the truck equipment; inspects, installs and repairs temporary cement and asphalt patches; hauls stock and concrete, removes surplus material; drives and is responsible for the operation of pumps and pump trucks; pumps and cleans manholes and vaults and pumps building basements; deliver equipment and material to associated jobs; makes scheduled inspections of manholes for defects or abnormal conditions in cables, ducts walls, covers and castings; makes special inspections of manholes and vaults for obvious defects in cable and equipment which might be associated with system trouble; takes appropriate corrective measures as required within his control; reports evidence of gas in manholes; performs maintenance work, such as: plugging ducts in manholes and buildings, replacing manhole covers and flooding and disinfecting manholes as required; prepares manholes and vaults for cable and equipment installation and splicing; installs and removes scaffolding and platforms in manholes and vaults; installs manhole tags and manhole location tags; drives and is responsible for the operation of the Ejector Truck and associated equipment; assumes responsibility for materials, tools and supplies assigned to or used on the Ejector Truck; drives and is responsible for the operation of the Generator Truck under agreed conditions; checks and services equipment as necessary; fireproofs cables; installs stanchions and hangers for hanging cable; operates power tools and equipment for the installation of stanchions and hangers; performs bricklaying and railing work associated with the construction and reconstruction of manholes; operates and services portable and truck compressors; maintains and adjusts pneumatic tools, pumps and air hoses in the field in connection with compressor work; inspects manholes; maintains adequate stock and equipment on the truck and at jobs in the field; operates commercial motor vehicles required for the performance of duties; submits required records and reports.

5. Working Conditions:

> May be required to work various rotating shifts, (any five days).

6. Mental Aspects: Must be alert, careful and have mechanical aptitude.

Approved By:

Steve Dixon

Date:

5/17/00

Approved By:

John J. Riley

Date:

5/17/00

*Dale W. Jiles
Cryder
Steph & Julie
James M. M. Hurd, Jr.*

UG LINEWORKER CLASS / CLASSROOM EVALUATION

Employee Name _____

Employee Number _____

Training Program Begins _____

Training Program Ends _____

Training Supervisor(s) _____

#	TASK	Date(s) Completed	Employee Signature	Trainer Signature
1	Review safety procedures	ongoing		
2	Review system voltages	various		
3	Review transformer theory			
4	Ohms Law			
5	Review test instruments	various		
6	Secondary connections, single phase & 3 phase			
7	Transformer connections			
8	Banking			
9	7 wire mains, limiters			
10	Use of jumpers			
11	Inlines			
12	200 amp elbows, padmount & manhole			
13	200 amp elbow jumpers			
14	Prove & break down 5kv lead joint			
15	Sweat connectors; single & multiple			

UG LINeworker CLAS CLASSROOM EVALUATION

Employee Name _____

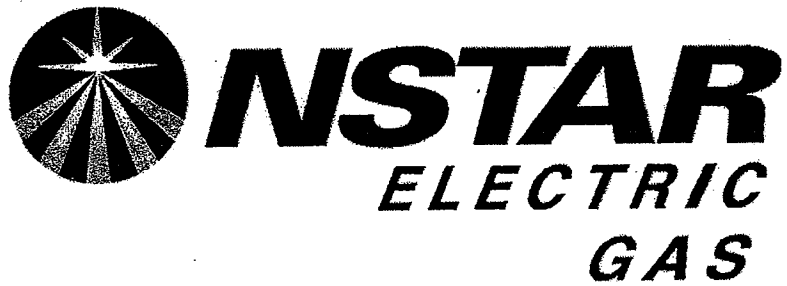
Training Program Begins _____

Training Supervisor(s) _____

Employee Number _____

Training Program Ends _____

#	TASK	Date(s) Completed	Employee Signature	Trainer Signature
16	Construct 5kv heat shrink joint			
17	Prove 5kv heat shrink de-energized			
18	5KV multiple			
19	5KV live end cap			
20	Manhole bonding, sweat & crimp			
21	15KV heat shrink straight			
22	15 KV heat shrink multiple			
23	15KV heat shrink termination			
24	Prove and breakdown 15KV lead joint			
25	Boil out cable			
26	Heat shrink single 3 way joint			
27	Heat shrink straight 3 conductor joint			
28	15KV live end cap			
29	15kv -3-cond live end seal			



UG 2 PART 1
TRAINING PROGRAM

CRAFT & COMPLIANCE

Underground Lineworker Progression

Job Classification	Prerequisites	Classroom	Field Work	Comments
UG Lineworker Class 3	½ day pre-screening.	3 weeks	1 year field training.	Entry-level position. In addition students will obtain a hoisting license and appropriate Class B drivers license.
UG Lineworker Class 2-Part I		2 weeks UG Lineworker Part I	2 weeks (as 3 rd person) 15 weeks on the job training.	Fieldwork is monitored using the UG 2 Part I Field Evaluation Sheets, which consists of 17 tasks.
UG Lineworker Class 2-Part II	UG 2 Part I Field Evaluation Sheet Must Be Completed.	2 weeks UG Lineworker Part II	2 week (as 3 rd person) 7 weeks with a Splicer 20 weeks field work 12 additional weeks at Mass Ave	Fieldwork is monitored using the UG 2 Part II Field Evaluation Sheets, which consists of 21 tasks.
UG Lineworker Class I	UG 2 Part II Field Evaluation Sheet Must Be Completed	4 weeks*	2 weeks as a 3 rd person	
Troubleshooter	Must Be Fully Trained UG 1 for 5 years to qualify	2 day review	6 months with a Troublemaker 6 weeks with an inspector	Troubleshooters are posted at needed by the Division
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment and procedures review.

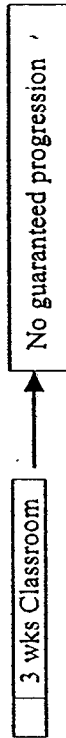
* Approximately 60 weeks to become a fully qualified UG 1.

The above chart details cable/conduit personnel training program to Splicer.

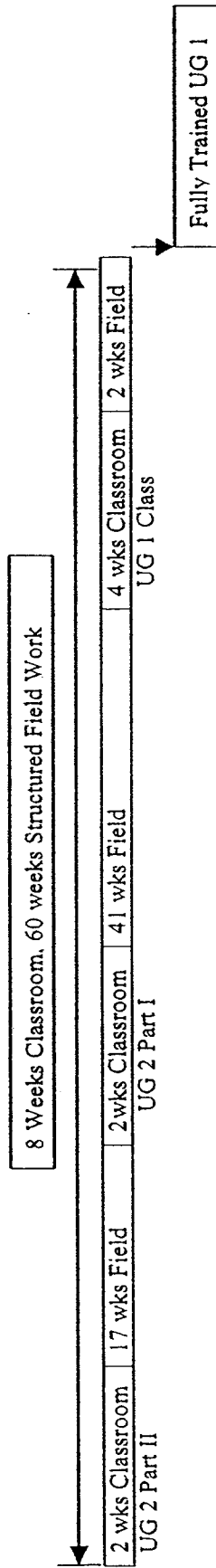
A written test is required at each level. Tests are not included in the training materials package but can be furnished upon request.

Underground Lineworker Progression

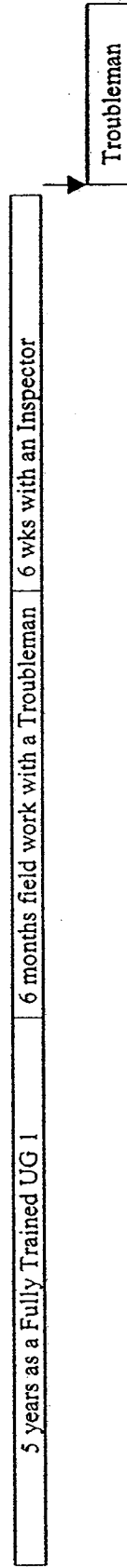
UG Lineworker Class 3



UG Lineworker Class 2 to Class 1



UG 1 to Troubleman (Troubleman Jobs Are Posted As Needed)

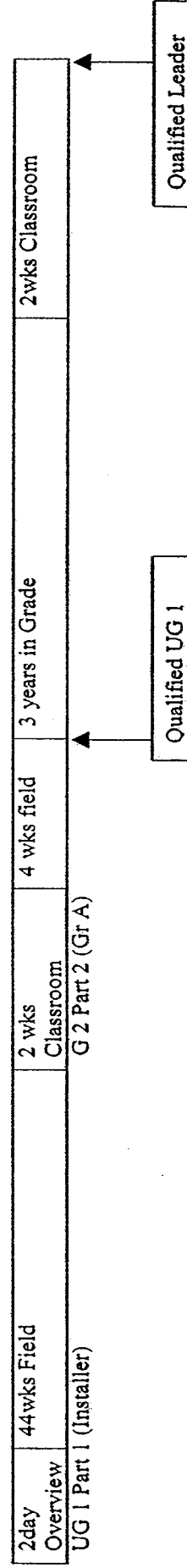


Underground Lineworker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part I (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 5 th person on a cable crew, 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work, 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review, New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.



UG LINEWORKER – CLASS 2 – PART 1

Day 1

- Review Safety Procedures:
 - OP 1.1-2A “Personal Protective Equipment”
 - OP 1.1-2D “Entering and Working in Underground Locations”
 - OP 1.1-2G “Job Briefing”
- Chip lead
- Using Volt Meter ID Secondary voltages
- Review banking, picking out neutral, picking out pairs

Day 2

- Hands-on
- Test equipment – identification and use
- Understanding Transformers
- Banking transformers utilizing transformer board
- Rotation of 3 phase service

Day 3

- Basic Electrical Knowledge Review
 - Hands-on
- Manhole racking
- Manhole bonding
- Review lead sleeve and solder preparation
- Sweat connector: split copper and split copper for multiple

Day 4

- Introduction to print reading
- Symbol definition
 - Hands-on

Secondary Connections
7-wire mains - Limiters

Day 5

- Review system voltages
- How to read NSTAR construction standards
 - Hands-on
- 5kV Heat Shrink Live End Cap CS2.1-3.28 (C2011)
- 200 amp elbows: underground – C2015, Padmount – C2012

Day 6

- Hands-on
- Inline Splicing CS 2.1-803
- 5kV Heat Shrink Straight Joint CS 2.1-3.24

Day 7

- Hands-on
- Sweat Connectors
- 5kv heat shrink straight CS 2.1-3.24

Day 8

Hands-on

- Prove de-energized and break down 5kV heat shrink straight
- 5kv heat shrink multiple

Day 9

Hands-on

- Prelim Transformers

Day 10

- REVIEW OF DAYS 1-9

Days 11 – 15

- Field work under Instructors Supervision

UG LINEWORKER CLASS II (PART 1) O.J.T. FIELD EVALUATION

Employee Name	Employee Number
Training Program Begins	Field Evaluation Begins
Training Program Ends	Field Evaluation Ends
Training Supervisor(s)	

#	TASK	Date Comp.	*Qualified Observers Initials	Trainees Initials	Comments
1	Demonstrates Good Safety Practices				
2	Demonstrates Knowledge of Manhole Entry Procedure				
3	Demonstrates Knowledge of System Voltages				
4	Secondary Cut-over				
5	3 Phase Services				
6	Pre-lim Transformer				
7	Cable racking				
8	Bond frames				
9	Banking 3 Phase				
10	Rotation				
11	Limiters				
12	200 Amp Elbows; padmount & manhole				
13	Inline				
14	5kv Heat Shrink Straight				
15	5kv Live End Cap				

*Qualified: Person who has successfully completed appropriate training and has field experience at the task.

PLEASE RETURN COMPLETED FORM TO SPLICING SCHOOL

UG LINEWORKER CLASS II (PA

1) O.J.T. FIELD EVALUATION

Employee Name _____

Training Program Begins

Training Program Ends

Training Supervisor(s)

Employee Number

Field Evaluation Begins
FEB 2, 2004

Field Evaluation Ends

FEB 2, 2004

MAY 7, 2004

[illegible]

PLEASE RETURN COMPLETED FORM TO SPLICING SCHOOL

UG LINEWORKER CLASS II (PART 1) CLASSROOM EVALUATION

Employee Name _____ Employee Number _____

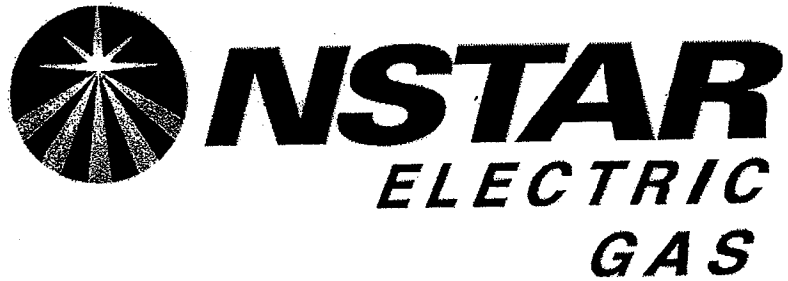
Training Program Begins _____ Training Program Ends _____

Training Supervisor(s) _____

#	Task	Date(s) Completed	Employee Signature	Trainer Signature
1	Review safety procedures	various		
2	System voltages ongoing			
3	Basic Ohm's Law ongoing			
4	Basic electrical and transformer theory ongoing			
5	Review network system			
6	Limiters; mole and line installation			
7	Test equipment – identification and use ongoing			
8	NSTAR construction standards ongoing			
9	200 amp load break elbow, padmount and manhole applications			
10	Inline splice			
11	Secondary connections – single phase and three phase			
12	Banking			
13	Rotation			

UG LINEWORKER CLASS II (PART 1) CLASSROOM EVALUATION

#	Task	Date Completed	Employee Signature	Trainer Signature
14	Pre-lim transformers			
15	Review manhole racking			
16	Chipping lead			
17	Bond frame installation and bond connections; crimped and sweated			
18	Sweat connectors – single and multiple			
19	5kV heat shrink live end cap			
20	5kV heat shrink joint construction			
21	Prove and break down 5kV heat shrink joint			
22	5kV live phasing			
23	5kV heat shrink multiple			
24	Meter installations (meter trainer)			



UG 2 PART 2
TRAINING PROGRAM

CRAFT & COMPLIANCE

Underground Lineworker Progression

Job Classification	Prerequisites	Classroom	Field Work	Comments
UG Lineworker Class 3	½ day pre-screening.	3 weeks	1 year field training.	Entry-level position. In addition students will obtain a hoisting license and appropriate Class B drivers license.
UG Lineworker Class 2-Part I		2 weeks UG Lineworker Part I	2 weeks (as 3 rd person) 15 weeks on the job training.	Fieldwork is monitored using the UG 2 Part I Field Evaluation Sheets, which consists of 17 tasks.
UG Lineworker Class 2-Part II	UG 2 Part I Field Evaluation Sheet Must Be Completed.	2 weeks UG Lineworker Part II	2 week (as 3 rd person) 7 weeks with a Splicer 20 weeks field work 12 additional weeks at Mass Ave	Fieldwork is monitored using the UG 2 Part II Field Evaluation Sheets, which consists of 21 tasks.
UG Lineworker Class I	UG 2 Part II Field Evaluation Sheet Must Be Completed	4 weeks*	2 weeks as a 3 rd person	
Troubleshooter	Must Be Fully Trained UG I for 5 years to qualify	2 day review	6 months with a Troublemaker 6 weeks with an inspector	Troubleshooters are posted at needed by the Division
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment and procedures review.

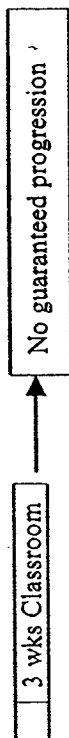
* Approximately 60 weeks to become a fully qualified UG I.

The above chart details cable/conduit personnel training program to Splicer.

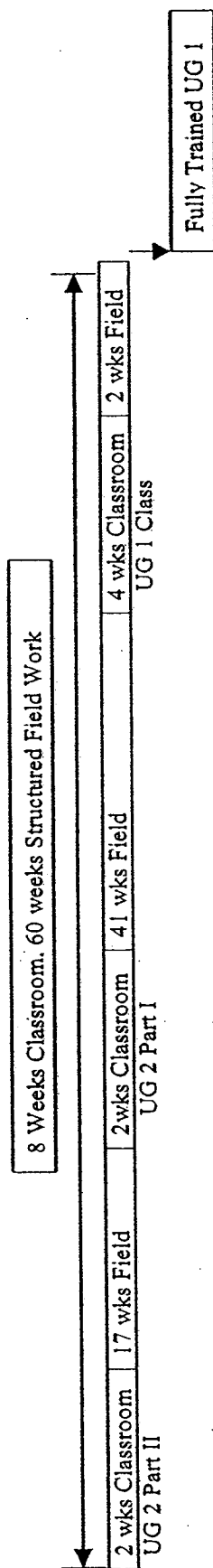
A written test is required at each level. Tests are not included in the training materials package but can be furnished upon request.

Underground Lineworker Progression

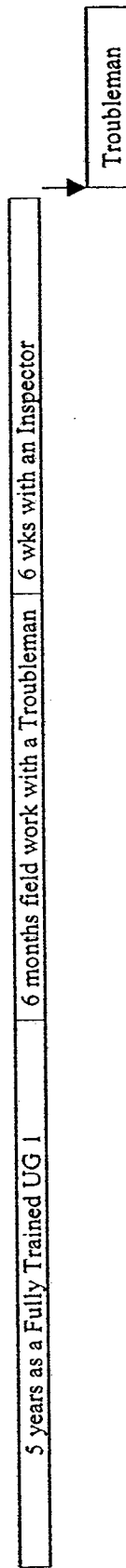
UG Lineworker Class 3



UG Lineworker Class 2 to Class 1



UG 1 to Troubleman (Troubleman Jobs Are Posted As Needed)

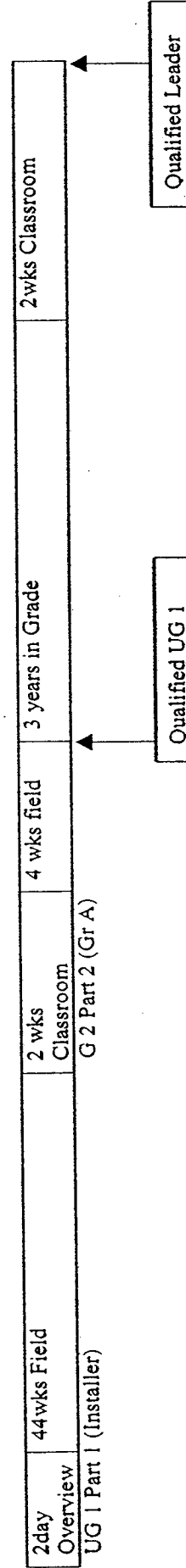


Underground Lineworker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part I (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 5 th person on a cable crew, 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work. 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.



UG LINEWORKER CLASS 2 PART 2

Day 1

- Review class outline
- Review safety procedures
- OP1.1-2A "Accident Prevention-Personal Protective Equipment"
- OP1.1-2D "Entering and Working in Underground Locations"
- OP1.1-2G "Job Briefings"
- Review construction standard reading
- Review system voltages
- Prepare ends and sweat connector for 5kV heat shrink

Day 2

- Construct 5kV heat shrink with gloves CS 2.1-2.34
- Prove de-energized and break down 5kV heat shrink
- Review Ohms Law
- Review transformer theory

Day 3

- Secondary connectors
- Use of jumpers
- Cytolok connectors
- Banking single phase and 3 phase
- C2105 "Construction and Installation of 200 Amp Loadbreak Elbow Terminations in Manholes"
- C2012 "Construction and Installation of 200 Amp Loadbreak Elbow Terminations for 15/25kV Pad-Mounted Equipment"

Day 4

- C4000 "Installation of 5kV-25kV, 600 Amp, EPDM Insulated, Underground Vacuum Switches"
- Circuit print reading
- Phone out cables
- Low tension phasing

Day 5

- Review testing equipment
- Tagging procedures
- C2000 "Heat Shrink Energized End Cap for 15kV Rated Flat Strap Neutral Cable"

Day 6

- CS2.10-10.24 "Installation of 15kV, 600 Amp, T-0P II Deadbreak Elbows for EPR Flat Strap Neutral Cables"
- Fault Indicators
- CS2.10-10.27 "Installing Network Transformers Straight Receptacle Adapters for 15kV Elastimold Disconnectible Splices"

Day 7

- C1700 "Heat Shrink Joint for Flat Strap Neutral Cable, Rated 15kV"
- Prepare ends and sweat connector for 15kV multiple

Day 8

- CS2.7-4.22 "Heat Shrink Termination for 15-25kV Flat Strap Neutral Cable Underground and URD Applications"
- 15kV heat shrink multiple
- Prove de-energized and break down multiple joint

Day 9

- C1710 "Heat Shrink Joint for 3/C Paper Insulated Lead Covered (P&L) Cable to 3-1/C Flat Strap (FS) Neutral Cables, Rated 15kV"
- Demonstrate construction of a single 3 way heat shrink joint

Day 10

- Review days 1 – 9.

Days 11-15

Field work under instructors supervision

POSITION PROFILE

Title:	UG Lineworker Class 2	Organization:	Electric Operations
Reports To:	Supervisor	Department:	Various
Date:	May 9, 2000	Area:	Various
Job Code:			

1. Role and Scope of Position:

- Responsible the inspecting, installing, constructing, maintaining, and repairing of plant and equipment.
- Directs and trains employees of an equal or lower rating.
- Works under general supervision.
- Works under directive supervision when installing cable or equipment

2. Essential Functions:

- Performs functions associated with cable & conduit installation.
- Operates trucks and equipment of any size in conjunction with inspecting, installing, connecting, disconnecting and repair of cable, conductors, and other plant and equipment
- Can assist or be assisted by personnel of a higher, equal, or lower rating for all tasks within the line of progression.

3. Accountability/Impact of Position:

- Accountable for all personal and crew/team performance consistent with company standards.
- Responsible for the safe conduct of all employees within their work team/crew.
- Responsible for displaying a positive company image with respect to customers and community.
- Responsible for providing accurate & timely information with respect to customer service.
- Responsible for maintaining a positive work environment by behaving and communicating in a professional manner that fosters good relationships with customers, clients, co-workers and supervisors.

4. Technical Knowledge/Skill/Education/Licenses/Certifications: (What do incumbents need to know to competently perform the role?)

Technical Knowledge/Skill: Must have the ability to learn: The fundamentals of electricity; the layout, functions and construction of the Company's underground electric system; the theory and practices of splicing, the standards and specifications for installation, maintenance, removal and repair of the underground electric system; the practices, principles of operations and the proper applications of equipment as prescribed by the Company for safety and first aid.

Experience: Must be qualified by experience on lower grade assignments in cable and conduit and splicing work. Must have demonstrated an interest in and aptitude for splicing, cable, and conduit work and ability in underground electric systems.

Licenses & Certifications: Massachusetts License to Operate Motor Vehicles Class A

5. **Illustrated duties:** In addition to the duties of an UG Lineworker Class 3, operates and adjusts winches and derricks which are part of the truck equipment; inspects, installs and repairs temporary cement and asphalt patches; hauls stock and concrete, removes surplus material; drives and is responsible for the operation of pumps and pump trucks; pumps and cleans manholes and vaults and pumps building basements; deliver equipment and material to associated jobs; makes scheduled inspections of manholes for defects or abnormal conditions in cables, ducts walls, covers and castings; makes special inspections of manholes and vaults for obvious defects in cable and equipment which might be associated with system trouble; takes appropriate corrective measures as required within his control; reports evidence of gas in manholes; performs maintenance work, such as: plugging ducts in manholes and buildings, replacing manhole covers and flooding and disinfecting manholes as required; prepares manholes and vaults for cable and equipment installation and splicing; installs and removes scaffolding and platforms in manholes and vaults; installs manhole tags and manhole location tags; drives and is responsible for the operation of the Ejector Truck and associated equipment; assumes responsibility for materials, tools and supplies assigned to or used on the Ejector Truck; checks and services equipment as necessary; fireproofs cables; installs stanchions and hangers for hanging cable; operates power tools and equipment for the installation of stanchions and hangers; performs bricklaying and railing work associated with the construction and reconstruction of manholes; operates and services portable and truck compressors; maintains and adjusts pneumatic tools, pumps and air hoses in the field in connection with compressor work; inspects manholes; maintains adequate stock and equipment on the truck and at jobs in the field; makes all types of splices and connections, installs terminals and duct splices, joints, racks, cuts, bonds and insulates de-energized underground and aerial cables for operation at 5,000 volts or less, in accordance with prescribed standards and specifications in the shop, on the Company system and on customers' premises; installs, connects and disconnects leads in junction boxes, breaker boxes, transformers, switches and other equipment. Identifies, tags and bonds cable and apparatus in accordance with underground standards; cuts, connects, and insulates energized cable and joints not exceeding 600 volts; installs and removes grounds, equipment and devices in accordance with prescribed practices; assembles, overhauls and refits in the shop, transformers, switches and other underground distribution and street lighting equipment for operation at 5,000 volts or less, installs cable pulling eyes in the shop for operation up to and including 25,000 volts; phases secondaries of single-phase and three-phase transformers for multiple operation, within prescribed voltage limitations; assists in connecting and disconnecting devices and performs the red tagging associated therewith, within prescribed voltage limitations; inspects cable and joints for operational defects; recognizes types of underground circuits. Requests application of the red tag system. Selects and places protective equipment. Identifies and tags conductors and apparatus by test current or equivalent method; applies standards, operating procedures and safe operating practices and works from written instructions, diagrams and sketches; assumes responsibility for stock, tools, and equipment for assigned work; reports abnormal conditions observed or encountered and takes appropriate corrective measures within his control; submits required records and reports; makes all 13.8kv and above non-leaded joints and terminations in URD type areas; operates commercial motor vehicles required for the performance of duties; submits required reports and records.

6. **Working Conditions:**

- Ability and willingness to perform heavy physical work indoors and outdoors in all seasons and at times for extended periods.
- Required to work various rotating shifts (any five days)

Approved By: <u>Steve Duncan</u>	Date: <u>5/17/00</u>
Approved By: <u>John J. Gilly</u>	Date: <u>5/17/00</u>

D. L. W. Jr.
C. J. Walcott
Steve Paul
James M. M. Guine Jr.

UG LINEWORKER CLASS II (PART 2) CLASSROOM EVALUATION

Employee Name _____ Employee Number _____

Training Program Begins _____ Training Program Ends _____

Training Supervisor(s)				
#	TASK	Date(s) Completed	Employee Signature	Trainer Signature
1	Review Safety Procedures	ongoing		
2	System Voltages			
3	Review Construction Standard Reading	ongoing		
4	Transformer Theory	ongoing		
5	Sweat connectors; straights & multiples			
6	Construct 5kV Heat Shrink Straight Joint			
7	Prove and Break Down 5kV Heat Shrink Joint			
8	5kV Live End Cap-Heat Shrink			
9	5kV Heat Shrink Single Multiple			
10	Inline Splice			
11	Secondary Connections, Use of Jumpers			
12	200 Amp Elbow Construction, Padmount and Manhole Applications			
13	Banking Single and 3 Phase Systems	various		
14	Review Testing Equipment			
15	200 amp elbow jumpers			

UG LINEWORKER CLASS II (F 2) CLASSROOM EVALUATION

Employee Name _____ Employee Number _____

Training Program Begins _____ Training Program Ends _____

Training Supervisor(s) _____

#	TASK	Date(s) Completed	Employee Signature	Trainer Signature
16.	Live Phasing			
17.	Bond Frame connections (crimp & sweat)			
18.	15kV Heat Shrink Live End Cap			
19.	600 Amp elbows			
20.	Network Vault Terminations			
21.	15kV Heat Shrink Straight Joint			
22.	15kV Heat Shrink Multiple			
23.	15kv Heat Shrink Termination			
24.	Review Low Tension Phasing			
25.	Meter Installations (meter trainer)			

UG LINEWORKER CLASS II (PART 2) O.J.T. FIELD EVALUATION

Employee Name	_____	Employee Number	_____
Training Program Begins	_____	Field Evaluation Begins	_____
Training Program Ends	_____	Field Evaluation Ends	_____
Training Supervisor(s)	_____		

#	TASK	Date Comp.	*Qualified Observers Initials	Trainees Initials	Comments
1	Demonstrate good safety practices				
2	Demonstrate knowledge of system voltages				
3	Single phase services				
4	3-phase services				
5	Secondary cut-over				
6	Transformer connections				
7	7 Wire main connections				
8	Banking single and three phase				
9	200 Amp elbow construction; manhole and padmount applications				
10	5kV heat shrink straight joint				
11	5kV heat shrink multiple joint				
12	Inline				
13	5kV Live end cap				
14	Rack cables				
15	Assist with live phasing				

***Qualified: Person who has successfully completed appropriate training and has field experience at the task.**

PLEASE RETURN COMPLETED FORM TO SPLICING SCHOOL

UG LINeworker CLASS II (P. 2) O.J.T. FIELD EVALUATION

Employee Name _____
 Training Program Begins _____
 Training Program Ends _____
 Training Supervisor(s) _____

Employee Number _____
 Field Evaluation Begins _____
 Field Evaluation Ends _____

#	TASK	Date Comp.	*Qualified Observers Initials	Trainees Initials	Comments
16	Phone out cables				
17	15kV heat shrink straight joint				
18	15kV live end cap				
19	15 kV heat shrink termination				
20	600 amp elbows				
21	15 kv heat shrink multiple				

PLEASE RETURN COMPLETED FORM TO SPLICING SCHOOL



UG 3 TRAINING PROGRAM

CRAFT & COMPLIANCE

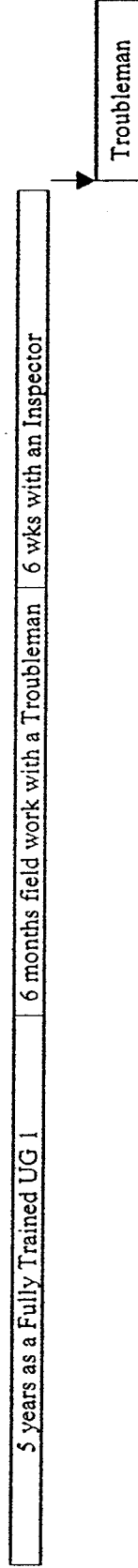
Underground Lineworker Progression

Job Classification	Prerequisites	Classroom	Field Work	Comments
UG Lineworker Class 3	1 1/2 day pre-screening.	3 weeks	1 year field training.	Entry level position. In addition students will obtain a hoisting license and appropriate Class B drivers license.
UG Lineworker Class 2-Part I		2 weeks UG Lineworker Part I	2 weeks (as 3 rd person) 15 weeks on the job training.	Fieldwork is monitored using the UG 2 Part I Field Evaluation Sheets, which consists of 17 tasks.
UG Lineworker Class 2-Part II	UG 2 Part I Field Evaluation Sheet Must Be Completed.	2 weeks UG Lineworker Part II	2 week (as 3 rd person) 7 weeks with a Splicer 20 weeks field work 12 additional weeks at Mass Ave	Fieldwork is monitored using the UG 2 Part II Field Evaluation Sheets, which consists of 21 tasks.
UG Lineworker Class I	UG 2 Part II Field Evaluation Sheet Must Be Completed	4 weeks*	2 weeks as a 3 rd person	
Troubleshooter	Must Be Fully Trained UG I for 5 years to qualify	2 day review	6 months with a Troublemaker 6 weeks with an inspector	Troubleshooters are posted at needed by the Division
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment and procedures review.

* Approximately 60 weeks to become a fully qualified UG I.

The above chart details cable/conduit personnel training program to Splicer.

A written test is required at each level. Tests are not included in the training materials package but can be furnished upon request.

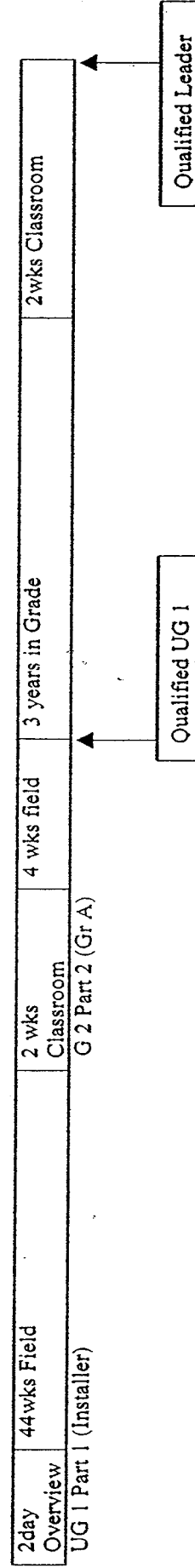


Underground L Worker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part I (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 3 th person on a cable crew. 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work. 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.



UNDERGROUND LINeworker CLASS 3

Day 1

- Introductions
- Review of course content
- Tour of school
- Review of W5003 "Accident Prevent, Personal Protective Equipment"

Day 2

- Review how to comprise a material stock request
- Review daily work order
- Hands-on: Pre-lim secondary crab with stub-outs; "Spiders" and mains
- Review cable arms, stantions, porcelains and how to insulate a cable arm

Day 3

- Review compliance chapter: OP 1.1-2D "Entering and Working in Underground Locations" and OP1.1-2G "Job Briefing"
- View manhole rescue film
- Review solder and basting oil preparation
- Hands-on: Make solder weights for Dig Safe
- Rasp lead sleeve and beat in

Day 4

- Review compliance chapter: W5003 "Accident Prevention, Personal Protective Equipment"
- Review hydraulic tools
- Review hand tools

Day 5

- DOT review with Mike Lambert (garage)

Day 6

- Compliance Chapter: Hazardous Materials, view asbestos video
- Review basic voltages
- Review test equipment, wiggies, tic tracer, etc.

Day 7

- Compliance chapter: Right to Know, view video
- Review how to prepare a heat shrink kit
- Review bonding
- Review cable connectors

Day 8

- Compliance chapter: Respiratory program
- Review how to set up a tool pan
- Hands-on: How to vee a split copper connector
- Tour location of stock room, tool room, cable and trash bins

Day 9

- Compliance Chapter: Tunnel Training
- Tour a NSTAR tunnel
- Review

Day 10

- CPR/First Aid

POSITION PROFILE

Title:	UG Lineworker Class 3	Organization:	Electric Operations
Reports To:	Supervisor	Department:	Various
Date:	May 9, 2000	Area:	Various
Job Code:			

1. Role and Scope of Position:

- Responsible for the inspecting, installing, constructing, maintaining, and repairing of plant and equipment.
- Incumbents work under general supervision.
- Incumbents work under directive supervision when installing cable or equipment.

2. Essential Functions:

- Performs functions associated with cable & conduit installation.
- Operates trucks and equipment of any size in conjunction with inspecting, installing, connecting, disconnecting and repair of cable, conductors, and other plant and equipment
- Can assist or be assisted by personnel of a higher, equal, or lower rating for all tasks within the line of progression.

3. Accountability/Impact of Position:

- Accountable for all personal and crew/team performance consistent with company standards.
- Responsible for the safe conduct of all employees within their work team/crew.
- Responsible for displaying a positive company image with respect to customers and community.
- Responsible for providing accurate & timely information with respect to customer service.
- Responsible for maintaining a positive work environment by behaving and communicating in a professional manner that fosters good relationships with customers, clients, co-workers and supervisors.

4. Technical Knowledge/Skill/Education/Licenses/Certifications: (What do incumbents need to know to competently perform the role?)

Technical Knowledge/Skill: Must have the ability to learn: The fundamentals of electricity; the layout, functions and construction of the Company's underground electric system; the theory and practices of splicing, the standards and specifications for installation, maintenance, removal and repair of the underground electric system; the practices, principles of operations and the proper applications of equipment as prescribed by the Company for safety and first aid.

Education: High School Education or equivalent

in underground electric systems.

Licenses & Certifications:

- Massachusetts License to Operate Motor Vehicles, and must pass a D.O.T. physical.
- Must obtain a Class A license before progressing.

Illustrated duties: Keeps stock, tools and equipment replenished and in good condition and in proper places; anticipates the needs, prepares and supplies tools and materials for the use of the employee he/she is assisting; applies standards, operating procedures and safe operating practices; maintains orderly condition in the work area at manholes and poles or in buildings and clears ground of tools, equipment, material and debris when job is completed; opens, guards and ventilates manholes; operates and tends pumps, mobile water pumps, blowers, portable generators and battery lights associated with the work of this grade; sets up tents, guards, and applies other protective equipment; sets up, operates and tends torches and furnaces, for heating solder and compound; maintains and sharpens tools used by those he/she is assisting; contacts customers and the public as directed; installs and removes terminal boxes, emergency switch boxes, split fiber main and secondary cable excluding electrical connections; bends, cuts, and threads, installs, removes and repairs pipes and ducts; installs and removes "Y" clamps and splits pipe carrying energized secondary cables; assists employees of higher rating in making electrical connections on secondary cable and equipment such as split fiber main and terminal boxes; installs and removes any de-energized underground cable or electrical apparatus, including high voltage oil and gas filled cable; installs, removes, relocates and repairs any type lamppost, excluding post tops, luminaries and electrical connections; replaces and regulates manhole frames to grade, including the associated brickwork; breaks out and repairs building, manhole, vault and tunnel walls; breaks out and repairs ducts and splits pipe over de-energized or energized cables of any voltage; assists in the performance of bricklaying and railing work associated with the construction and reconstruction of manholes; replaces and repairs ladders and gratings in manholes, vaults, and tunnels; cleans, chips, and paints ladders and gratings in manholes, vaults, and tunnels; constructs a simple form for concrete construction, such as street light bases; digs and backfills trenches and operates pneumatic paving breakers, drills, and tampers; mixes and places cement; loads and unloads trucks with tools, stock, dirt and material associated with the job; clears work area of debris, snow, and dirt; cleans mud, dirt, and debris from manholes, vaults and tunnels; acts as a helper; submits required reports and records.

5. Working Conditions:

- Ability and willingness to perform heavy physical work indoors and outdoors in all seasons and at times for extended periods.
- May be required to work various rotating shifts (any five days)

6. Mental Aspects: Must be alert, careful and have mechanical aptitude.

Approved By: <u>Steve Dawson</u>	Date: <u>5/17/00</u>
Approved By: <u>John J. Cifely</u>	Date: <u>5/17/00</u>

Don Lh
Ch. Halbert
Steve F. Sullivan
James M. McKeen, Jr.

UG LINEWORKER CLASS III CLASSROOM WORK

Employee Name	_____	Employee Number	_____
Training Program Begins	_____	Field Evaluation Begins	_____
Training Program Ends	_____	Field Evaluation Ends	_____
Training Supervisor(s)	_____		

#	TASK	Date Comp.	Trainers Initials	Trainees Initials	Comments
1	Compliance Training				
2	OP2.10-8A – Tunnel Rescue				
3	DOT (Mike Lambert)				
4	CPR/First Aid				
5	How to read daily work order				
6	How to comprise a material stock request				
7	Review cable arms, porcelain, stanchions, and how to insulate cable arms				
8	Hands on: Prelim secondary crab using stub-outs and "spiders"				
9	Review solder and basting oil prep				
10	Hands-on make solder weights				
11	Rasp lead sleeve and beat in				
12	Review hydraulic tools				
13	Review hand tools				
	Review basic voltages				
15	Review test equip, wiggies, tic tracer, big wiggies, etc.				

UG LINEWORKER CLASS III CLASSROOM WORK

Employee Name	_____	Employee Number	_____
Training Program Begins	_____	Field Evaluation Begins	_____
Training Program Ends	_____	Field Evaluation Ends	_____
Training Supervisor(s)	_____		

#	TASK	Date Comp.	Trainers Initials	Trainees Initials	Comments
16	Review heat shrink kit preparation				
17	Review bonding				
18	Review cable connectors				
19	Review how to set up a tool pan				
20	Hands-on how to vee out a copper				
21	Hands-on how to set up truck tent				
22	Tour stock room, tool room, cable and trash bins				
23					
24					
25					
26					
27					
28					
29					

STOCK LIST

BATTERIES		TAPE		GLOVES	
7 1/2	5719	1 1/2 ARC	1783	LEATHER	241
9v	5716	1' MASK	6371	LINERS	240
AA	5722	2' MASK	6372	SNORK	229
AAA	5723	3' ARC	1784	LG CANV	231
C	5725	COTTON	6370	SM CANV	242
D	5717	DUCT	6362	WINTER	239
		FRIC	6368	LIQUID	230
BOOTS		PLASTIC	6374	UG PROT	244
SZ 9	209	RUBBER	1788	OH PROT	247
* 10	210	RAIN GEAR		SCREW DRIVER	
* 11	211	JACKET SM	6093	3"	6283
* 12	212	'MED	6094	4"	6284
* 13	213	*LG	6095	6"	6285
* 14	214	*XLG	6096	10"	6286
* 15	215	*XXL	6097	PHILIPS	6281
* 16	216	XXXL	6098	WATER COOLERS	
BROOMS		PANT SM	6175	1 GAL	5823
STREET	5777	*MED	6176	2 GAL	5824
CORN	5778	*LG	6177	3 GAL	5825
FLOOR	5788	*XLG	6178	5 GAL	5826
COUNTER	5787	*XXL	6179	CABLE CUTTERS	
WISK	5779	*XXXL	6180	BOLT	5897
KNIVES		COAT SM	6240	SM. RACHET	5902
HOOK	6104	*MED	6241	LG RACHET	5910
SHARP POINT	6103	*LG	6242	M D 6	6084
HACKING	6105	*XLG	6243	LONG RED	5898
SHOE	6111	*XXL	6244	SHOVELS	
LINEMAN	6108	XXXL	7959	D HAND COAL	6296
HAMMERS		FLASHLIGHTS		LONG H COAL	6295
CLAW	6045	2 CELL	5994	D HAN SPADE	6294
TINNER	6046	3 CELL	5993	LG HAN SPADE	6295
4LB	6047	CARPEN	6131	D HAN SNOW	6298
12LB	6049	CONT TEST	6376	LG HAN SNOW	6299

TOOLS		MISC			
PRUNE SAW	6275	SPEEDY DRY	5648	ANT & ROACH	6089
PUTTY KNIFE	6110	SPILL KIT BUCKET	6893	WASP SPRAY	6085
RULE TAPE	6265	SWITCHING HELMET	267	W D 40	6148
TAPE 100'	6373	SWITCH COAT SZ 48	223	LADDER 13'	378 13666
CRES WRENCH 6'	6416	SWITCH COAT SZ 50	224	LADDER 20'	312
CRES WRENCH 8'	6411	SWITCH COAT SZ 54	225	LADDER 6'	319
CLAW WRENCH	6423	SWEEP COMP	5881	LADDER 24'	313
CHANNEL LOCK	6221	HAND SOAP TUB	5847	LADDER 4'	318
HACKSAW FRAME	5997	HAND SOAP SM ORA	186	ZERO HOODS	6136
ALLEN WRENCH	6420	HAND SOAP LG ORG	187	SPLIC MIRROR	6152
CHISEL 18"	5840	SAFETY GLASSES CL	7022	SOLVANT A	5666
CHISEL 8"	5839	SAFETY GLASSES TI	7023	TOILET TISSUE	6208
SIDE CUT PLYER 9'	6224	CABLE TIES BLACK	1807	PAPER TOWELS	6389
SIDE CUT PLYER 6'	6223	CABLE TIES WHITE	6378	MOP HEADS	6161
CLAW WRENCH LG	6448	WATER GEL PACK	168	NUTTY GREEN	5674
POCKET KNIFE	6109	WATER GEL BLANKE	6998	PERLE GREEN	5675
PLYER DIA CUT	6218	DRINK CUP	5894	PLASTIC BOTTLE	5849
SOCKET EXT BAR	5712	EXT CORD	5886	BRUSH OVAL SM	5795
SOCKET SET	6314	FIBRE BOX	2493	BRUSH OVAL LG	5796
TOURCH HEAT SHR	6390	FIRE BLANKET	194	PVC CEMENT SM	1212
SOCKET HANDLE	6412	FIRST AID BAG	190	PVC CEMENT LG	1213
PAPER CUTTER	5895	FIRST AID FACE	276	PRESS. GAUGE	6038
WRENCH PROP	6410	FLAGS ORANGE	154	DUCT FOAM	1380
HAVE HOOK	6072	GAS REGULATOR	6239	STREET DIR	5950
SHOOT A LITE	5995	HARD HAT RACHET	5670	SPLIT PORCEL	2464
NUT DRIVER 3/8	6426	HARD HAT UG	266	BLUE TY SUIT	221
NUT DRIVER 5/16	6424	HARD HAT OH	217	COMP THERM	6387
NUT DRIVER 7/16	6425	FIRST AID KIT LG	272	LG DRIP PAN	6200
NUT DRIVER 9/16	6430	FIRST AID KIT SM	271	LG FIRE EXT.	5952
WRENCH URD	6448	PROPANE CYL SM	5904	LG FLOU BULB	6123
VICE GRIPS	6422	LOCK COMB.	6144	HYD CEMENT	5829
WRENCH T	1809	LOCK 3C	6143	GROUND CLAMP	1229
WRENCH SET	6432	LOCK DIFF	6146	EYE WASH STA.	294
VICE STARR	6400	LOCK YALE	6142	#16 WIRE	108
WIGGIES	291	BAG KLINE	5708	#6 WIRE	99
TIC TRACER	292	BAG CANVAS	5696	DE-ICER	6145
CABLE ID TAGS	6361	BAG ARIEL	5697	DIGGING BAR	5710
CEMENT	1215	BAG UTILITY	2063	EYE CLEANER LG	295
MED RESPERATOR	284	LG RESPERATOR	279	EYE CLEANERSM	296
BOX RAC 5/8-11/16	6443	BELZONA	1493	DISPOS. RESP	277
BOX RAC 5/8-3/4	6444	P+B PAINT	1627	BUS BAR LG	1134
BOX RAC 3/4-7/8	6435	CARD FILE	5853	BUS BAR SM	1135
BOX RAC 3/4-9/16	6436	STAKION TOOL	6384		
FLOOD LIGHT	5803	GAS PLYERS	6219		
100W BULB	5804	SHARP STONE	6346		

HEAT SHRINK SOLIDICE SPARE PARTS

Item	Spare Part	BECo	COM	Init order	Set up NB/CB	MFR	Part Number
		Catalog ID #	Catalog ID #	Total	min levels/per		
1	Aluminum Oxide Cloth 120 grit	Need new SS Number	13-01-118				
2	Aluminum Oxide Cloth 80 grit	0582	13-01-116	50	10	3M	
3	Solvent Wipe Packets	5666	13-74-131	1000	100	3M	#02417
4	Oil Barrier Tube	1699 (#4 AWG)	07-80-530			PT Technologies	#PFWD2510
		1698 (350 MCM)	07-80-540			Raychem	
5	Large Spring Clamps	7868	07-09-742	50	10	Raychem	
6	Small Spring Clamps	7869	07-09-740	50	10	Raychem	#EPPA-034-F
7	Conductor Plug for Live End Seal Kit					Raychem	#EPPA-034-E
	15 kV, #4-350 for HVES-1521D, & -1522D		07-06-345	20	2	Raychem	EPPA-121-HESP-100-filled
	15 kV, 500 - 750 for HVES 1523D		07-06-347	20	2	Raychem	EPPA-121-HESP-150-filled
	5 kV, #2 - 4/0 for LESJ-1		07-06-348			Raychem	
	5 kV, 250 - 750 for LESJ-2		07-06-349			Raychem	
8	Yellow Mastic	7870	07-48-190	50	10	Raychem	
9	Red Mastic	7871	07-48-191	50	10	Raychem	S1189-3-600
10	3 Sleeve Cond. Xaga (re-jacketing sleeve)					Raychem	S1251-25-300-1
	0.3-1.5" x 48"						
	1.3-4.3" x 48"						
11	Zipper and Lock In Clip	7881	07-72-090			Raychem	MBSM-43/8-1200
		7882	07-72-093			Raychem	MBSM-125/30-1200
12	#4 Flat Braid	7883	07-09-800	20	5	Raychem	CHAN-MBSM-417
		7872	07-05-965	20	5	Raychem	NE246736T
13	Barrel Connector (Crimp Connector)	7884	07-13-700	100	10	Raychem	YSM2C

ALL ITEMS NOT HIGHLIGHTED IN RED ARE TO GO TO "NO PURCHASE/obsolete".

ALL ITEMS HIGHLIGHTED IN RED WERE AGREED TO BE RETAINED FOR THE SYSTEM.

SAFETY GLASSES

INDUS ID	DESCRIPTION	USAGE	
		1997	1998
00170	Glasses, safety, visitor, tour guard II	305	31
00172	Glasses, safety, clear, small black, use cat id 7022	420	966
00173	Glasses, safety, clear, large black, use cat id 7022	901	633
00174	Glasses, safety, tinted, small black, use cat id 7023	338	166
00175	Glasses, safety, tinted, large black, use cat id 7023	498	359
05667	Side shields, clip on, for aerolite safety glasses - do not re order	N/A	2
07023	Glasses, safety, glasses, safety, smoke, anti-fog, black frame	N/A	N/A
07042	Glasses, safety, safety glass, dark mod 6T277 by uvex	N/A	N/A
07043	Glasses, safety, lens dark mod 6T279 for frame 6T277 by uvexv	N/A	N/A
07044	Glasses, safety, lens clear mod 3KN11 for frame 6T277 by uvex	N/A	N/A
07060	Glasses, safety, lens dark mod 6T279 for frame 6T277 by uvexv	N/A	N/A
07061	Glasses, safety, lens clear mod 3KN11 for frame 6T277 by uvex	N/A	N/A
07139	Glasses, safety, american allsafe company protective eyewear	N/A	N/A
10785	Case, eyeglass, for safety glasses, plastic case, Norton #1080	23	36
10786	Strap, elastic, for glasses, Norton #501	11	2
10787	Case, eyeglass, for glasses, pocket, carrying case, black vinyl	73	98
10789	Case, safety, plastic, Norton #18040, tinted	25	21
10790	Case, safety, Phoenix II, clear	433	474
10791	Case, safety, Phoenix II, gray	434	429
10792	Glasses, safety, clear lenses for Phoenix II safety glasses	65	32
10793	Glasses, safety, dark gray lenses for Phoenix II safety glasses	117	61
11496	Tissue, glasses, K-LENS-M, disposable lint-free paper lens tissue	379	388
12686	Glasses safety glasses safety glasses safety glasses safety glasses		
12688	Case safety glasses safety glasses safety glasses safety glasses		
12689	Glasses safety glasses safety glasses safety glasses safety glasses		
12690	Glasses safety glasses safety glasses safety glasses safety glasses		
12691	Case safety glasses safety glasses safety glasses safety glasses		
12692	Glasses safety glasses safety glasses safety glasses safety glasses		
12693	Frame safety glasses safety glasses safety glasses safety glasses		
12694	Glasses safety glasses safety glasses safety glasses safety glasses		

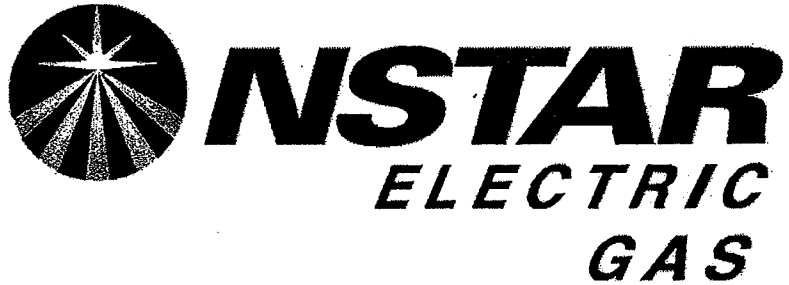
Paper suits - 221

Re-order Truck Stock-4kv Conversion

- Universal Bond Kits Cat #1446
- Elastimold Kits Cat # 1454
- H/S tubes for Elastimold Cat # 1812
- 15 kv elbow 200 amp Cat # 0688
- Elbow re-jacketing kit Cat #1457
- 200 amp s/postion standoff Cat # 1120
- Xfmer sec. spade insul. Kit Cat #1458
- Insulated grounding cap RTE Cat #1206 (for use on PM xfmer)
- Insulated grounding cap ELASTIMOLD Cat # 0522 (use on MH xfmer,steel pull pin)
- 50 ft. 1/0 bare (bond frame) Cat # 0100
- 50 ft #4 bare (for grounding) Cat # 0114
- bag ground clips Cat # 1229
- 4kv H/S live caps (4/0-500) Cat #1447
- 4kv H/S live caps (#4-1/0) Cat # 1445

"Other Stuff"

- | | |
|--|---|
| <ul style="list-style-type: none"> • 3 position switching station Cat # 0688 • 4 position switching station SS-235400 • 500 MCM 600 volt hypalon Cat #0139 • 500 MCM bare (neutral) Cat # 0118 • 4/0 MCM 600 volt hypalon Cat #0007 • 4/0 MCM bare (neutral) Cat #0116 • # 6 bond wire (100' roll*order by foot) Cat #0099 • Solvent A packets Cat #5666 • 500 neutral crab Cat # 1421 • 500 insulated crab Cat #1417 • 4/0 neutral crab Cat # 1419 • 4/0 insulated crab Cat #1416 • Richards stub outs (for crabs) Cat #1420 • 600 volt H/S/ crab tubes Cat # 1456 • Hi-Link 1/0 Cat #1456 • Hi-Link 4/0 Cat # 1468 • Hi-Link 350 Cat # SS-235266 • Hi-Link 500 Cat # 1473 • Hylug 1/0 Cat # 1398 • Hylug 4/0 Cat # SS-234635 • Hylug 500 Cat # SS-234653 • 4/0split copper Cat # SS-238887 | <ul style="list-style-type: none"> Cotton Glove Cat # 0240 Fire Blanket Cat # 0194 Plastic Tape Cat # 6374 Arc Proof Cat # 1783 Rubber tape Cat # 1788 Hand Cleaner Cat # 5847
 "D" Batteries Cat # 5717 Tic Tracer Cat # 0292 Leather Gloves Cat # 0241 Grd Lugs Cat # 1104 |
|--|---|



UG TROUBLESHOOTER
INSPECTOR

CRAFT & COMPLIANCE

Underground Lineworker Progression

Job Classification	Prerequisites	Classroom	Field Work	Comments
UG Lineworker Class 3	½ day pre-screening.	3 weeks	1 year field training.	Entry-level position. In addition students will obtain a hoisting license and appropriate Class B drivers license.
UG Lineworker Class 2-Part I		2 weeks UG Lineworker Part I	2 weeks (as 3 rd person) 15 weeks on the job training.	Fieldwork is monitored using the UG 2 Part I Field Evaluation Sheets, which consists of 17 tasks.
UG Lineworker Class 2-Part II	UG 2 Part I Field Evaluation Sheet Must Be Completed.	2 weeks UG Lineworker Part II	2 week (as 3 rd person) 7 weeks with a Splicer 20 weeks field work 12 additional weeks at Mass Ave	Fieldwork is monitored using the UG 2 Part II Field Evaluation Sheets, which consists of 21 tasks.
UG Lineworker Class I	UG 2 Part II Field Evaluation Sheet Must Be Completed	4 weeks*	2 weeks as a 3 rd person	
Troubleshooter	Must Be Fully Trained UG 1. for 5 years to qualify	2 day review	6 months with a Troublemaker 6 weeks with an inspector	Troubleshooters are posted at needed by the Division
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment and procedures review.

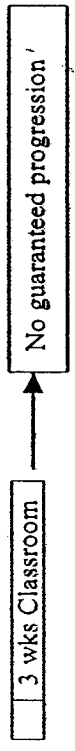
* Approximately 60 weeks to become a fully qualified UG 1.

The above chart details cable/conduit personnel training program to Splicer.

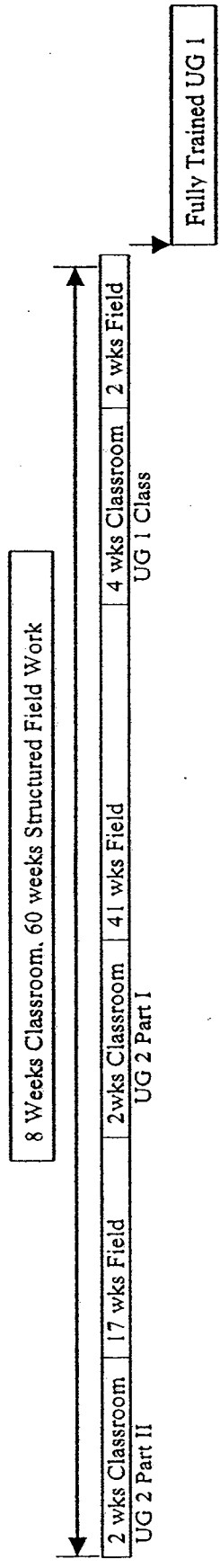
A written test is required at each level. Tests are not included in the training materials package but can be furnished upon request.

Underground Lineworker Progression

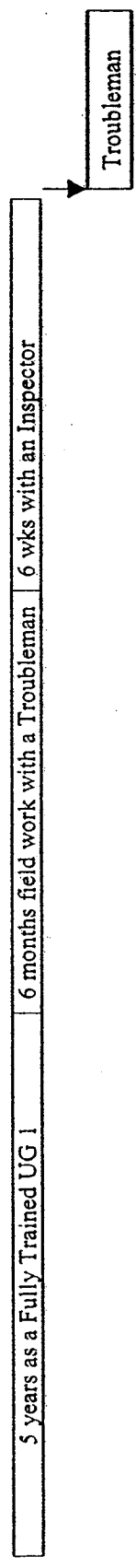
UG Lineworker Class 3



UG Lineworker Class 2 to Class 1



UG 1 to Troubleman (Troubleman Jobs Are Posted As Needed)

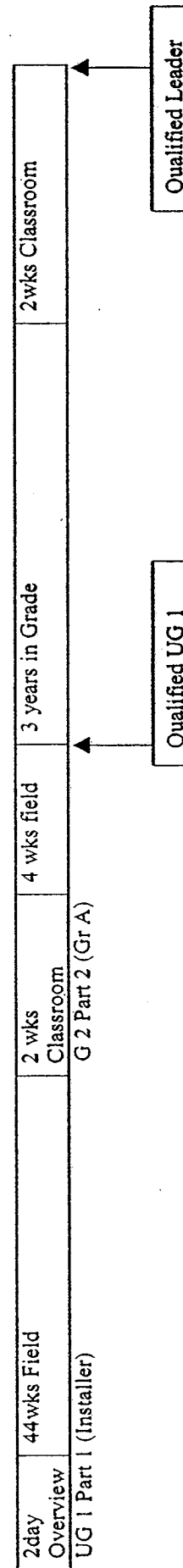


Underground Lineworker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part I (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 5 th person on a cable crew. 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work. 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review, New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.



TROUBLESHOOTER / INSPECTOR REVIEW

- A. Job Briefing
 - 1. Review OP1.1-2G
 - 2. Discuss requirements for conducting a proper job briefing
- B. Test Instruments
 - Review all test instruments
 - Demo proper use and care of test instruments
- C. Timco Phaser for Cable ID
 - 1. Review and demo use of Timco for cable ID and phase marks on single conductor cable
 - 2. Battery replacement
- D. Use of DC Hi-pot Adapter
 - 1. Demo "Live" DC Hi-pot on cable
 - 2. How to interpret meter
- E. Review 13.8kV Loop Design
 - 1. Show 2 circuit loop scheme
 - 2. Describe U.G. equipment used in loop
 - 3. Show fault isolation
- F. RDA Switch
 - 1. Review operation of switch
 - 2. Review fusing of oil fuse cutouts
- G. SC/MC Switchgear
 - 1. Review operation of switch
 - 2. Review fuse replacement
- H. PME-9 Switch
 - 1. Review operation of switch
 - 2. Review fuse replacement
 - 3. Review 200A and 600A elbows
 - 4. Review Phasing 600A switches
- I. Live Phasing – 5kV and 15kV
 - 1. Live phase 5kV cables (demo)
 - 2. Live phase 5kV 600A switch
- J. Review Auto Source Transfer Switch
 - 1. Operation of switch
 - 2. Fuse replacement
- K. Howard Transformers
 - 1. Review fuse replacement

- L. Switching Stations
 - 1. Switching stations on 13.8kV circuits
 - 2. Single phase and three phase taps to the overhead
- M. Heat Shrink Joints
 - 1. Explain various kit sizes
 - 2. Explain proving H.S. joints
- N. Bolt Connected Joints and Terminations
 - 1. Discuss network transformer terminations
 - 2. Demo bolt connected joint assembly
- O. 200A – 600A Elbows
 - 1. Construction of 200A elbow
 - 2. Operation of 200A elbow
 - 3. Construction of 600A elbow
 - 4. Installation of 600A elbow
- P. Breakers, Relays, Protections
 - 1. 4kV and 13.8kV breaker operation
 - 2. Explain use of relays and protectors

POSITION PROFILE

Title:	UG Lineworker Leader	Organization:	Electric Operations
Reports To:	Supervisor	Department:	Various
Date:	May 9, 2000	Area:	Various

Job Code:

1. Role and Scope of Position:

- Responsible for the inspecting, installing, constructing, maintaining, and repairing of plant and equipment.
- Directs and trains employees of an equal or lower rating.
- Incumbents works under general supervision.

2. Essential Functions:

- Directs and performs functions associated with cable, electrical equipment, and conduit to install, repair, and/or remove.
- Operates trucks and equipment of any size in conjunction with inspecting, installing, connecting, disconnecting and repair of cable, conductors, and other plant and equipment.
- Can assist or be assisted by personnel of a higher, equal, or lower rating for all tasks within the line of progression.

3. Accountability/Impact of Position:

- Accountable for all personal and crew/team performance consistent with company standards.
- Responsible for the safe conduct of all employees within their work team/crew.
- Responsible for displaying a positive company image with respect to customers and community.
- Responsible for providing accurate & timely information with respect to customer service.
- Responsible for maintaining a positive work environment by behaving and communicating in a professional manner that fosters good relationships with employees, customers, clients, and supervisors.

4. Technical Knowledge/Skill/Education/Licenses/Certifications: (What do incumbents need to know to competently perform the role?)

Technical Knowledge/Skill: Must have full knowledge of: The fundamentals of electricity; the layout, functions and construction of the Company's underground electric system; the theory and practices of splicing, the standards and specifications for installation, maintenance, removal and repair of the underground electric system; the practices, principles of operations and the proper applications of equipment as prescribed by the Company for safety and first aid.

Experience:

- Must be qualified by experience on lower grade assignments in cable and conduit and splicing work.
- Must have demonstrated an interest in and aptitude for splicing, cable, and conduit work and ability in underground electric systems.

Licenses & Certifications: Massachusetts License to Operate Motor Vehicles Class A

Illustrative duties: In addition to the duties of an UG Lineworker Class 1, directs, participates in, and is responsible for the installation, removal and maintenance of underground transmission, distribution and street lighting system cable, conduit, duct lines, manholes, terminal boxes, transformers, switches, lampposts, lamps and luminaries and other similar apparatus and equipment; makes all types of electrical connections on energized or de-energized cable and equipment; performs soldering operations; directs employees so that work is performed in an efficient manner in accordance with safe practices and in conformity with operating and construction standards; instructs employees in the performance of the work that he is directing; cares for and conserves materials, tools and equipment; initiates request and makes recommendations relating to work under his direction; deals with municipal representatives, customers and others; operates commercial motor vehicles required for the performance of duties; prepares necessary reports and records associated with the work including field reports, time sheets, requisitions, and daily work reports.

5. Working Conditions:

- Ability and willingness to perform moderately heavy physical work indoors and outdoors in all seasons and at times for extended periods.
- Required to work various rotating shifts (any five days)

6. Mental Aspects:

- Must be analytical, alert, careful and have mechanical aptitude.
Must have the ability to lead a group of employees with confidence and guide them effectively, fairly, and efficiently.

Approved By: Steve Dason

Date: 5/17/00

Approved By: John J. Gilly

Date: 5/17/00

Dylan W. Fitch
Chris Halpern
Steph E. Halpern
James M. McKeen Jr

Job Specification Apprentice Underground

Qualifications

A. Physical Requirements

1. Ability and willingness to perform moderately heavy physical work indoors and outdoors in all seasons and at times for extended periods.

B. Knowledge and Experience

1. Five (5) years experience as a Splicer Grade A;
2. Massachusetts License to operate motor vehicles;
3. Must have mechanical aptitude, be alert, resourceful and careful.

Commitments

- A. Upon acceptance agrees to progress to the position of Underground Trouble Shooter or Construction Inspector Cable - A when vacancies occur.

Scope

The title Apprentice Underground designates employees working in the field, generally under abnormal system conditions, in connection with the operation and maintenance of underground plant, apparatus and equipment which may involve splicing procedures.

1. Job Summary

Under the direction of an Underground Trouble Shooter, locates, investigates, inspects, clears trouble and unsafe conditions and restores service, on the Underground transmission, distribution and street lighting systems and locates faults on customers' cable and equipment.

2. Illustrative Duties

- a. Under the direction of an Underground Trouble Shooter performs the duties of an Underground Trouble Shooter.
- b. With the assistance of an Underground Trouble Shooter performs the functions of a Splicer Grade A when making repairs to restore customer outage due to underground system disturbances or in addressing maintenance work.

Fact Sheet

1. Apprentices will be provided the opportunity to get one month of conventional troubleshooter training at some point during the initial six month training period.
2. Junior qualified employees will fill permanent apprentice vacancies that aren't filled by senior qualified volunteers. (Article XIX)
3. Permanent apprentice vacancies in Somerville will be filled temporarily (if senior person has not been fully trained) by senior qualified person at that time.
4. Generally, after trouble is found by trouble/apprentice crew and extensive repairs are required, splicing crews will be sent to finish the job unless splicers have other critical assigned work. It is not the intent of the company to tie trouble crews up in long term repairs.
5. Future openings in Construction Inspector/Troubleshooter rate will still be available to existing Construction Inspectors/Troubleshooters subject to examination process. Any opening resulting from this move would be filled from apprentice rate.
6. An advisory committee of Union and Management has been formed to address all existing and future training needs.
7. A separate subcommittee will also be formed (union/management) to address equipment needs arising from this agreement.

- g) Install/Remove 200 amp elbows with the exception of switching stations, such as "turtles" and coffins. Elbows at these locations would be installed/removed in conjunction with a Troubleshooter or an added qualified person.*
 - h) Install/Replace cutout boxes controlling a single phase tap. If safe clearance cannot be obtained or if jumping is necessary an added qualified person would be utilized.
 - i) Transfer straight line single phase construction.
 - j) Install/Replace Hot Line Clamps under no load conditions.
- 2) If the Leader feels that it is not safe for a two person Hot Stick crew to perform the assigned task, the Leader may request additional personnel. After the request for additional personnel is granted and the assignment has been completed, when the Leader returns to the Service Center, if necessary, the need for additional personnel will be reviewed. The Local agrees to cooperate with management to ensure that abuse does not occur.
- 3) All overtime call in** for 13.8 kV line work will be two (2) Leaders Overhead Lines and two (2) Hot Stick Line Workers, except when conditions warrant using all available personnel, such as a severe storm.

- * Qualified person is defined as a Hot Stick Line Worker or above.
- ** Call in is defined as unplanned overtime.

C. Progression to Hot Stick Line Worker

The progression from Overhead Line Worker - A to Hot Stick Line Worker will be automatic after the completion of 24 months in the Overhead Line Worker A classification and completion of hot stick school.

D. URD Fault Locating

Overhead Hot Stick Troubleshooters agree to fault locate on primary URD/UCD cable in URD developments using approved equipment excluding the thumper truck.

E. 13.8kV Switching

1. The Overhead Hot Stick Troubleshooters agree to perform 13.8kV switching on padmounted or subsurface equipment that can be operated from street level.
2. Overhead Hot Stick Troubleshooters will not enter the manhole to perform this switching.
3. Underground Troubleshooters and Construction Inspectors-Cable A will perform switching on all manhole and padmounted equipment at operating potential up to and including 13.8 kV. Pole mounted equipment will not be operated by underground personnel.

4. The term "switching" includes the testing of equipment at an approved test point by using an appropriate testing device and procedure.
5. For Construction Inspector-Cable A, switching and testing associated with switching does not mean or include physically removing jackets, semi-conductor, or lead sheath from cables, breaking down joints, or testing which is normally performed by Underground Troubleshooters or Splicers.
6. The above changes do not apply to Underground Construction Inspectors-Cable A or Underground Troubleshooters who are grandfathered under the provisions of Section F(6).

F. Construction Inspector/UG Troubleshooter Overlap - *Relation to 4kV*

1. Underground Troubleshooters, in addition to the fault locating on 4kV circuits, can direct and inspect the removal and installation of transformers, switches, and apparatus in similar equipment replacements by Company employees to restore customer outage due to underground system disturbances in the absence of an available Construction Inspector-Cable A. Directs and is responsible for phasing and poling of circuits in-stations, load centers, primary network units, manholes and other system locations to restore customer outage on 4 kV circuits due to underground system disturbances in the absence of an available Construction Inspector-Cable A.
2. Construction Inspector-Cable A inspects, investigates and clears faulty and unsafe conditions up to and including 4kV to restore customer outage due to underground system disturbances in the absence of an available Underground Troubleshooter.
3. It is agreed that relief would be assigned to the appropriate job classification based on the type of work to be completed.
4. The intent of the Agreement is to allow for a more flexible method of addressing system problems up to and including 4kV.
5. It is agreed by both parties that this Agreement will not be used to eliminate Underground Troubleshooter or Construction Inspector-Cable A positions.
6. The Company will agree to grandfather up to a total of 3 positions from the Construction Inspectors-Cable, Underground Troubleshooters rate in their existing positions (no more than 2 from either classification). All grandfathered employees must be located at Mass. Avenue in the Splicing Division, and will be placed on a separate roster and overtime list.
7. The Company agrees to create an additional day shift Underground Troubleshooter position at Mass Ave.

G. Streetlights - Underground

1. Troubleshooters to be assigned knocked down post cutoffs. Splicers to be assigned if there are no Troubleshooters available.
2. Leaders C&C to be assigned no current lookups, from the feed manhole to the lamp base only, and connections and disconnections of street lighting apparatus in addition to their current job specifications. Additional work to include all secondary connections and disconnections on street lighting type service cables in manholes when the connections in the manhole are mechanical. The term service in this case refers specifically to secondary cables from the manhole to the base of the lamp, fire alarm, traffic control or street light control box, but will not include house services.
 - a) Temporary connections and disconnections will be made on cable outside the joint in manholes where lead joint construction is still existent.
 - b) Temporary repairs or installations should be permanent in nature until such time as the manhole can be cut over into crab type multiple secondary connectors which are installed by Splicers.
 - c) Leaders Cable & Conduit will be assigned the no current lookups (Item 2).
 - d) Grade A Cable & Conduit Installers will be assigned street light apparatus connections and disconnections and will complete under direction of the Leaders Cable & Conduit (Item 2).

H. Training and Equipment

- 1) The Company will supply and maintain all appropriate equipment for the performance of the above.
- 2) The Company will provide all appropriate training for the performance of the above.
- 3) The Company and Union will meet within 10 working days of the signing of this agreement to develop a training agenda and schedule.

I. Wage Adjustments

In consideration for the performance of the above, the Company agrees to add the following amounts to the base rates of specified classifications:

UG Troubleshooter	\$.67*
OH Hot Stick Troubleshooter	\$.75
Leader Overhead Lines	\$.75
Construction Inspector Cable	\$.875*
Hot Stick Line Worker	\$.75

The effective date of the increases above will be June 4, 1995.

*No increases will be provided to those UG Troubleshooters and Construction Inspectors Cable who elect to grandfather under the provisions of Section F(6).

In consideration for the performance of G above, the Company agrees to add the following amounts to the base rates of specified classifications:

	<u>Effective 6/4/95</u>	<u>Effective 6/4/96</u>
Leader Cable & Conduit	\$.30	
Construction Inspector Conduit A & B	\$.30	
Construction Inspector Conduit C	\$.30	\$.10
Cable and Conduit Installer A	\$.30	\$.10

In addition, Splicers will receive a one-time payment of \$500 on June 4, 1995.

J. Helper Underground (Trouble):

1. The Helper Underground position will be eliminated from the Underground Trouble Room effective June 4, 1995.
2. Existing Helpers Underground will have the following options:
 - a) Remain a Helper Underground, assigned to the Splicing Division.
 - b) Enter the Splicer progression at the 3rd step of Splicer C.
 - c) Enter the Cable & Conduit Installer progression at the third step of Grade B (limited to 2 positions).
3. Helpers Underground who select options b or c above will receive a one time payment of \$1,000.

K. Underground Apprentice

1. The job title Underground Apprentice will be created (See Attached) effective the signing of this Agreement, the pay rate for the new classification will be as follows:

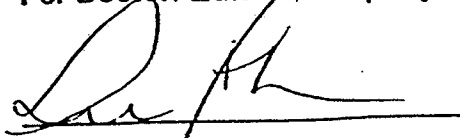
Underground Apprentice Step 1 \$23.495

Underground Apprentice Step 2 \$24.245
2. Vacancies to Underground Apprentice will be filled through the Splicer Grade A rate by seniority based on fitness and ability. If at any time the candidate opts out, he/she will return to the Grade A Splicer classification and pay rate and will not be eligible to re-enter the program for at least one (1) year.
3. Step 1 will be a six-month Step. At the conclusion of six months the candidate will receive a minimum of six weeks Construction Inspector Cable - A training. Qualified candidates will be required to attend the C/I - Trouble Shooter Training Program.
 - a) At the conclusion of six weeks C/I Training candidates will be required to take and pass the accepted qualifying exam. Upon successful completion of the qualifying exam, the candidate will progress to Apprentice Step 2.

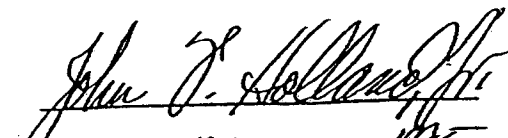
- b) If candidate fails to pass the exam, he/she will be allowed to retest after thirty (30) days.
- c) If candidate fails to pass a second qualifying exam, he/she will be removed from the Apprentice job classification and returned to the classification and pay rate of Splicer Grade A. After a period of one (1) year, he/she will be allowed to requalify if a vacancy exists.
- 4) After successfully passing qualifying exam, the Apprentice will be eligible to cover temporary vacancies in the Underground Trouble Shooter and Construction Inspector Cable A classification.
 - a) Filling of scheduled temporary vacancies will be filled in accordance with Article XIX of the Collective Bargaining Agreement.
 - b) Temporary vacancies within the Apprentice job classification will be filled through the Splicer Grade A position from within the Division where the vacancy occurs. *5 yrs as Grade A*
- 5) The Local and the Company will continue to negotiate the minimum amount of Splicers Grade A to be trained to cover vacancies within the Apprentice job classification.
- 6) The Local and the Company will meet to update and modify P&M progression Chart #4B.
- 7) Considerations will be made for those Splicers Grade A's already trained and qualified in the Underground T/S or C/I Cable-A job classifications.
- 8) Apprentices will not be assigned routine maintenance type splicing during inclement weather (as defined in Stipulation #8).
- 9) It is agreed by the parties that this Agreement will not be used to eliminate the Splicer classifications.
- 10) It is not the intent of this agreement that the new trouble team become the exclusive classification capable of performing system restoration work.
- 11) The Company and the Union agree to meet during the initial 6 months of the program to assess training and revise, as necessary.

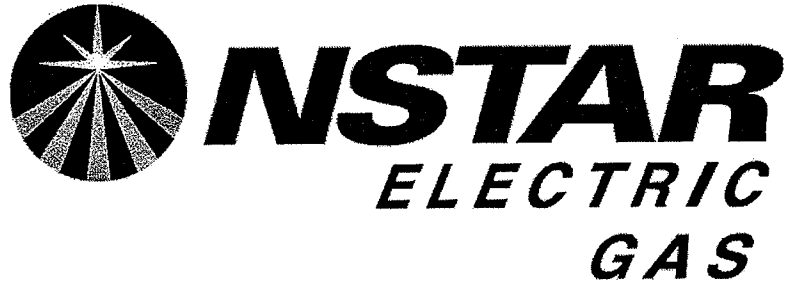
Agreed to:

For Boston Edison Company:


52595

For UWUA Local 369:


May 25, 1995



UG CABLE AND CONDUIT

CRAFT & COMPLIANCE

Underground Lineworker Progression

Job Classification	Prerequisites	Classroom	Field Work	Comments
UG Lineworker Class 3	½ day pre-screening.	3 weeks	1 year field training.	Entry-level position. In addition students will obtain a hoisting license and appropriate Class B drivers license.
UG Lineworker Class 2-Part I		2 weeks UG Lineworker Part I	2 weeks (as 3 rd person) 15 weeks on the job training.	Fieldwork is monitored using the UG 2 Part I Field Evaluation Sheets, which consists of 17 tasks.
UG Lineworker Class 2-Part II	UG 2 Part I Field Evaluation Sheet Must Be Completed.	2 weeks UG Lineworker Part II	2 week (as 3 rd person) 7 weeks with a Splicer 20 weeks field work 12 additional weeks at Mass Ave	Fieldwork is monitored using the UG 2 Part II Field Evaluation Sheets, which consists of 21 tasks.
UG Lineworker Class I	UG 2 Part II Field Evaluation Sheet Must Be Completed	4 weeks*	2 weeks as a 3 rd person	
Troubleshooter	Must Be Fully Trained UG I for 5 years to qualify	2 day review	6 months with a Troublemaker 6 weeks with an inspector	Troubleshooters are posted at needed by the Division
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment and procedures review.

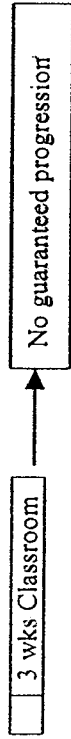
*Approximately 60 weeks to become a fully qualified UG I.

The above chart details cable/conduit personnel training program to Splicer.

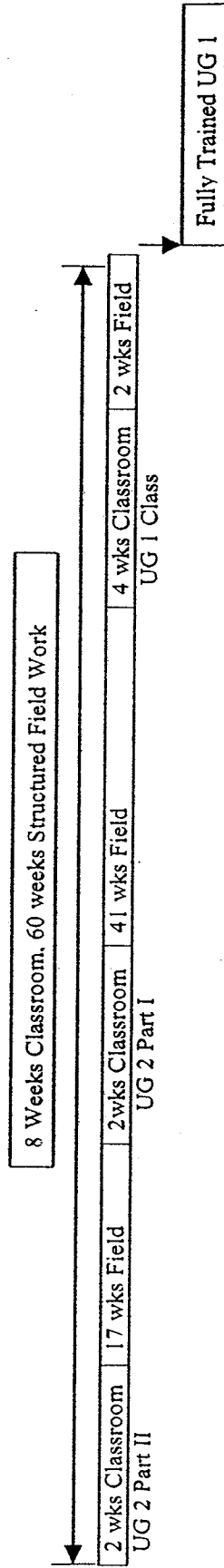
A written test is required at each level. Tests are not included in the training materials package but can be furnished upon request.

Underground Lineworker Progression

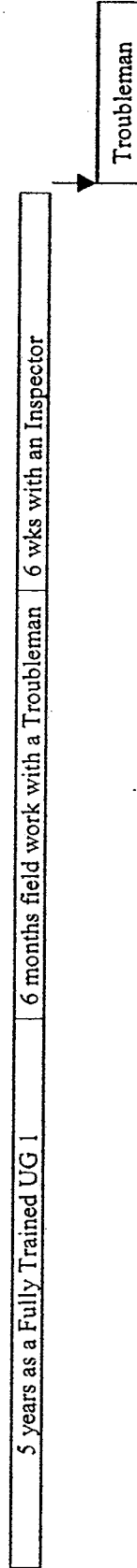
UG Lineworker Class 3



UG Lineworker Class 2 to Class 1



UG 1 to Troubleman (Troubleman Jobs Are Posted As Needed)

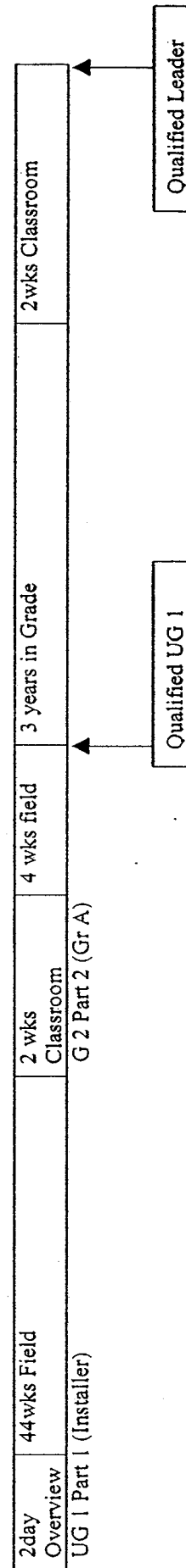


Underground Lineworker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part 1 (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 5 th person on a cable crew. 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work. 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review, New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.



Underground Lineworker Progression

The chart below details Splicing personnel training program to cable/conduit Leader.

Job Classification	Prerequisites	Classroom	Field Work	Comments
Cable UG 1 Part I (old Installer Grade)	Fully Qualified UG 1-Splicer	2 day overview	44 weeks field work	4 weeks as 5 th person on a cable crew. 40 weeks as the 4 th person on a cable crew. Complete Field Evaluation Sheets.
Cable UG 1 Part 2 (Old C&C Grade A)	Completed field work and evaluation sheets.	2 weeks	4 weeks field work	
Cable & Conduit Leader UG 1 part 3	Completed classroom and field work. 3 years as a Class I (C&C Grade A)	2 weeks	3 years experience as a C&C Grade A	
Annual - All Grades		5 Days		CPR/First Aid and Compliance Training/Insulate Isolate review. New tools, equipment & procedures review.

Approximately 4 years to become a fully trained as a Leader.

